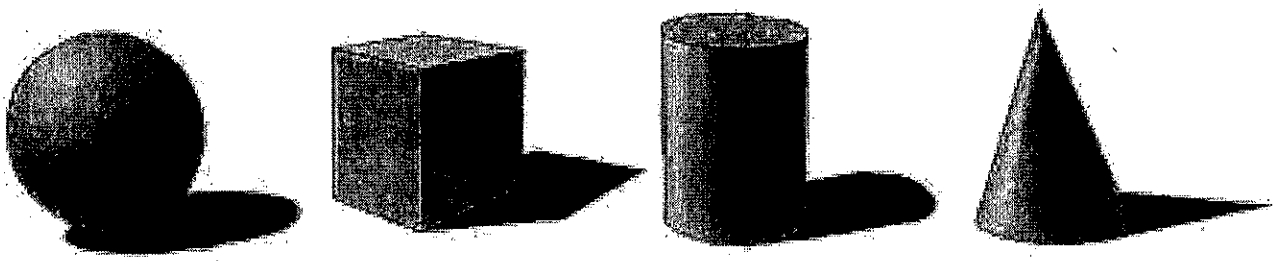
Pre-Algebra

Lesson 9.2

Chapter 10

Angles, Area, & Volume



Name _____

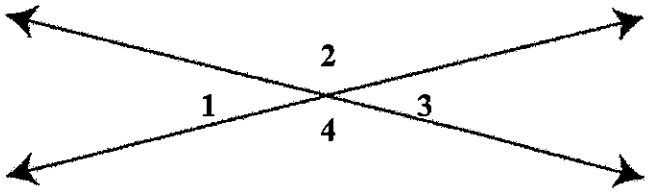
Period _____

Objective:

Vocabulary

	Definition	Example
Adjacent Angles		
Vertical Angles		
Congruent Angles		
Supplementary		
Complementary		

Example 1: Find the measure of each angle.
Find $m\angle 1$, $m\angle 2$, and $m\angle 3$ if $m\angle 4 = 110^\circ$.

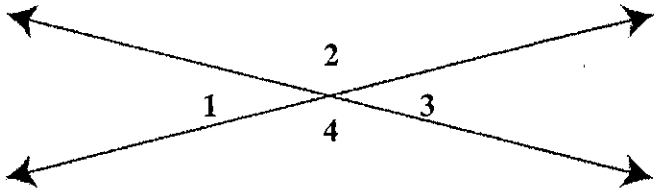


$m\angle 1 =$ _____

$m\angle 2 =$ _____

$m\angle 3 =$ _____

Example 2: Find the measure of each angle.
Find $m\angle 2$, $m\angle 3$, and $m\angle 4$ if $m\angle 1 = 28^\circ$.



$m\angle 2 =$ _____

$m\angle 3 =$ _____

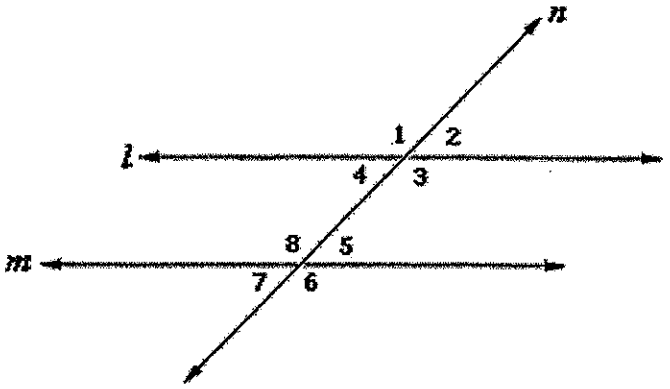
$m\angle 4 =$ _____

	Definition	Example
Transversal		
Corresponding Angles		
Alternate Interior Angles		
Alternate Exterior Angles		

When a transversal intersects ***parallel*** lines, the following angles are congruent:

- _____
- _____
- _____
- _____

Example 3: In the diagram, $l \parallel m$. Identify each of the following:



(a) congruent corresponding angles

(b) congruent alternate interior angles

(c) congruent alternate exterior angles

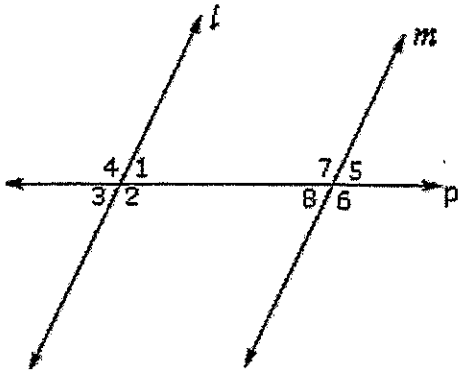
(d) vertical angles

Example 4: In Example 3, $m\angle 3 = 120°$. Determine the measure of all other angles.

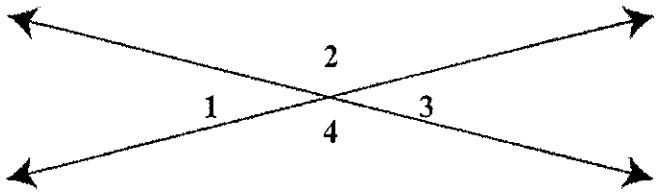
$m\angle 1 =$
$m\angle 2 =$
$m\angle 4 =$
$m\angle 5 =$
$m\angle 6 =$
$m\angle 7 =$
$m\angle 8 =$

Example 5: If $m\angle 1 = 65°$, determine the measure of all other angles. Assume $l \parallel m$.

$m\angle 2 =$
$m\angle 3 =$
$m\angle 4 =$
$m\angle 5 =$
$m\angle 6 =$
$m\angle 7 =$
$m\angle 8 =$



Extra Practice 1: Find the measure of each angle.
Find $m\angle 1$, $m\angle 2$, and $m\angle 3$ if $m\angle 4 = 135°$.

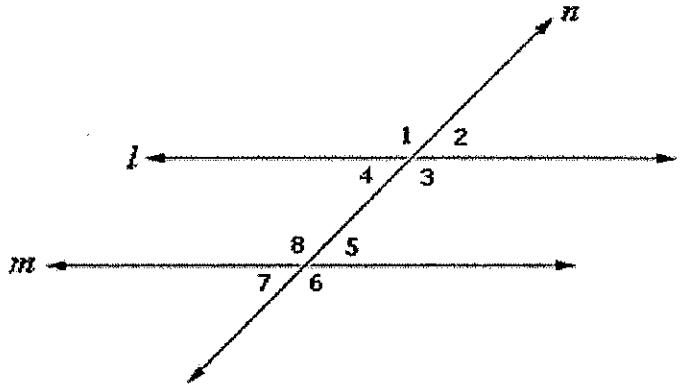


$m\angle 1 =$ _____

$m\angle 2 =$ _____

$m\angle 3 =$ _____

Extra Practice 2: In the diagram, $l \parallel m$. If $m\angle 5 = 25°$, determine the measure of all other angles.



$m\angle 1 =$
$m\angle 2 =$
$m\angle 3 =$
$m\angle 4 =$
$m\angle 6 =$
$m\angle 7 =$
$m\angle 8 =$

What type of angles are $\angle 2$ and $\angle 4$? _____

What type of angles are $\angle 1$ and $\angle 4$? _____

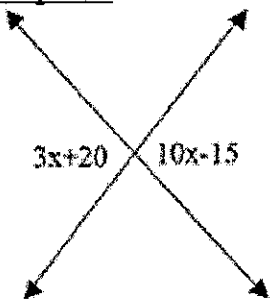
What type of angles are $\angle 2$ and $\angle 5$? _____

What type of angles are $\angle 2$ and $\angle 7$? _____

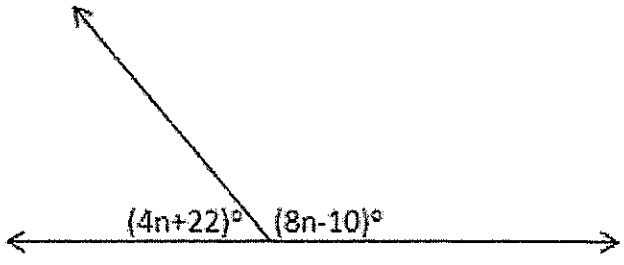
What type of angles are $\angle 3$ and $\angle 8$? _____

Example 6: Find the measure of each angle.

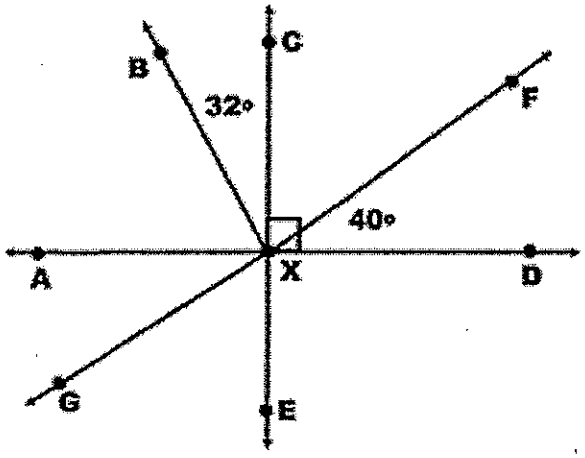
(a)



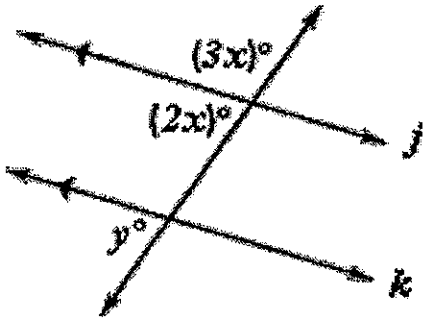
(b)



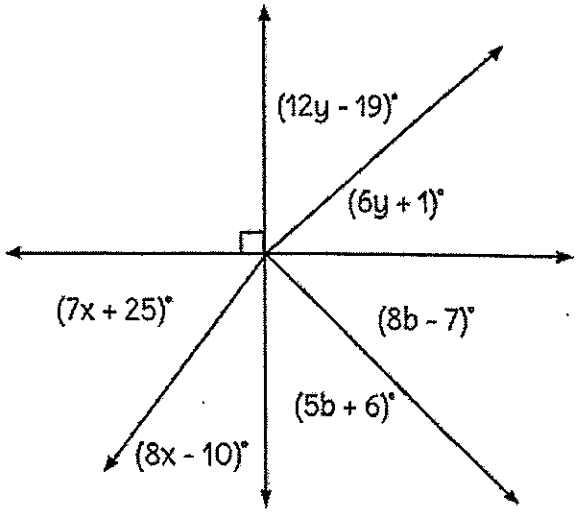
Example 7: Determine the measure of each angle in the diagram below. Label the diagram.



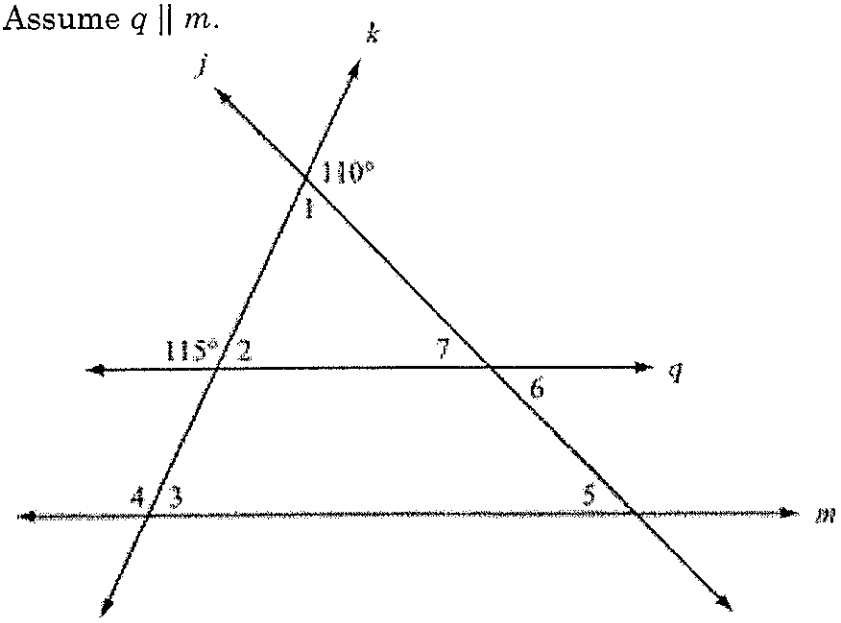
Example 8: Determine the measure of each angle in the diagram below. Label the diagram.



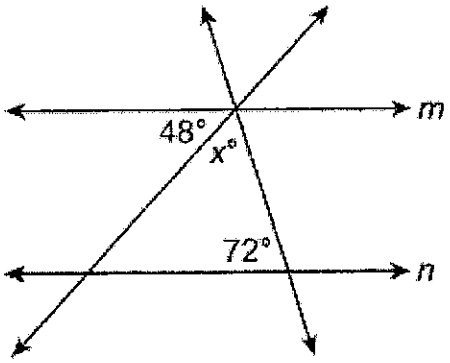
Example 9: Determine the measure of each angle in the diagram below. Label the diagram.



Example 10: Determine the measure of each numbered angle in the diagram below. Assume $q \parallel m$.

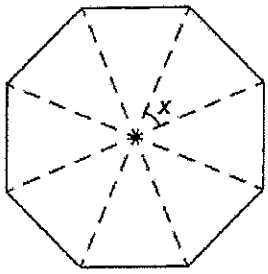


Example 11: Determine the measure of x in the diagram below. Assume $m \parallel n$.

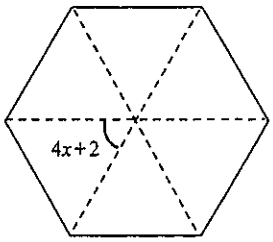


Example 12: Determine the value of x.

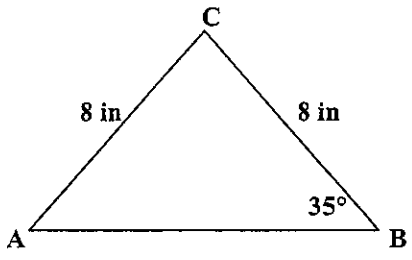
(a)



(b)



Example 13: Triangle ABC is shown below. What is the measure of Angle C?



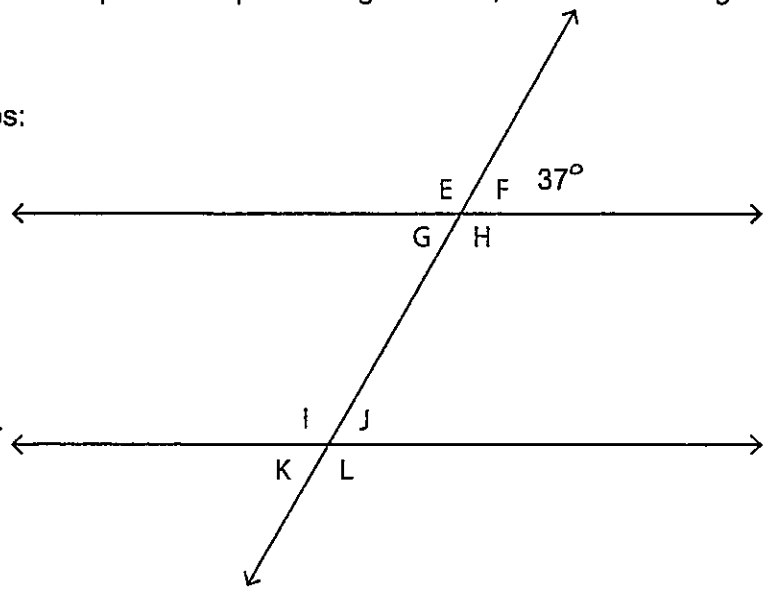
Name : _____ Score : _____

Angle Relationship

Write the angle relationship for each pair of angles. Also, determine all angle measures in the diagram below.

Angle Relationships:

- Corresponding
- Vertical
- Supplementary
- Alternate Interior
- Alternate Exterior



1) ∠J and ∠F are _____

2) ∠E and ∠G are _____

3) ∠J and ∠K are _____

4) ∠G and ∠I are _____

5) ∠H and ∠L are _____

6) ∠K and ∠E are _____

7) ∠F and ∠K are _____

8) ∠H and ∠G are _____

9) ∠E and ∠H are _____

10) ∠G and ∠J are _____

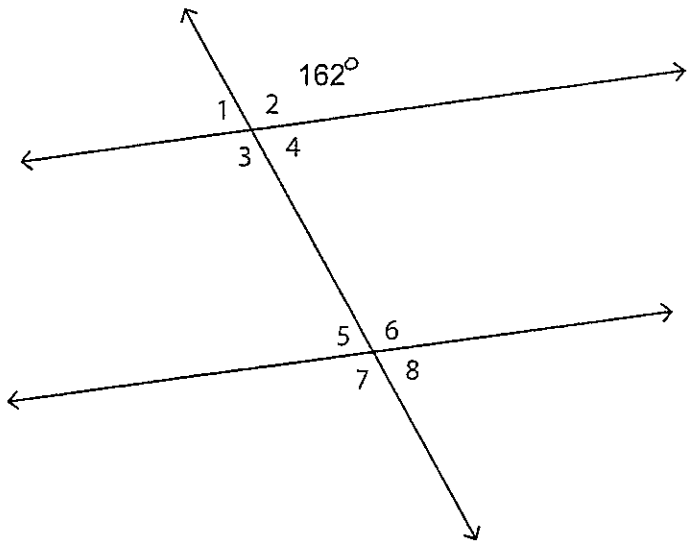
Name : _____ Score : _____

Angle Relationship

Find the angle relationship for each pair of angles. Also, determine all angle measures in the diagram below.

Angle Relationships:

- Corresponding
- Vertical
- Supplementary
- Alternate Interior
- Alternate Exterior



1) ∠1 and ∠4 are _____

2) ∠2 and ∠7 are _____

3) ∠4 and ∠8 are _____

4) ∠3 and ∠5 are _____

5) ∠6 and ∠8 are _____

6) ∠1 and ∠7 are _____

7) ∠3 and ∠6 are _____

8) ∠1 and ∠3 are _____

9) ∠2 and ∠6 are _____

10) ∠6 and ∠7 are _____

Name : _____

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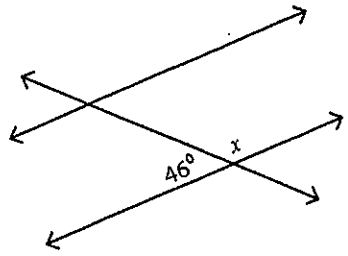
Angles in Transversal

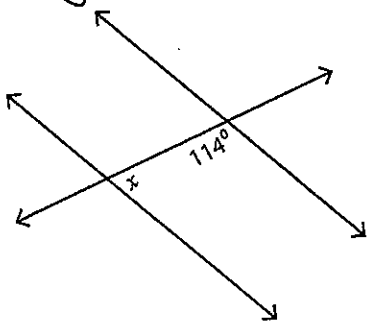
Find the value of x. * Also, state the relationship between the angles.

1)



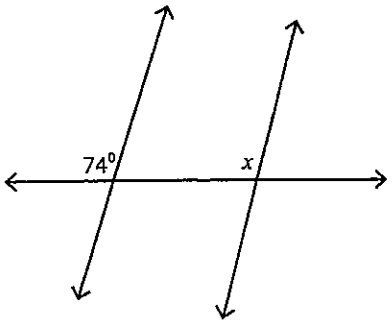
$x =$ _____

2)



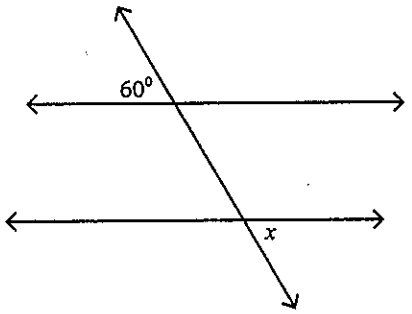
$x =$ _____

3)



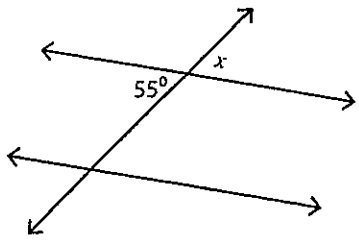
$x =$ _____

4)



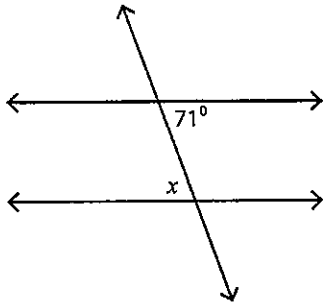
$x =$ _____

5)



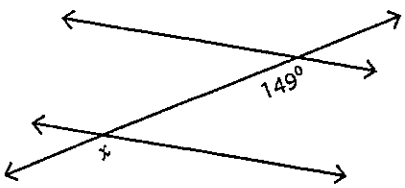
$x =$ _____

6)



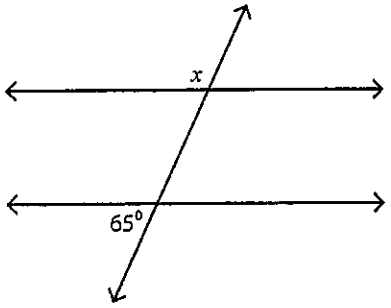
$x =$ _____

7)



$x =$ _____

8)



$x =$ _____

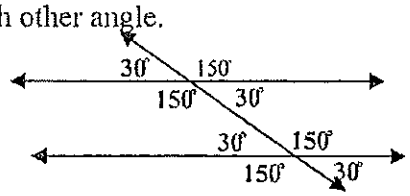
Name_____

Lesson 9-2

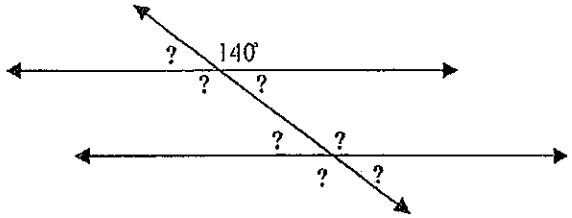
FINDING UNKNOWN ANGLE MEASURES

Directions: For each set of parallel lines, you are given the measure of one angle. Use your knowledge of parallel lines and transversals to find the measures of each other angle.

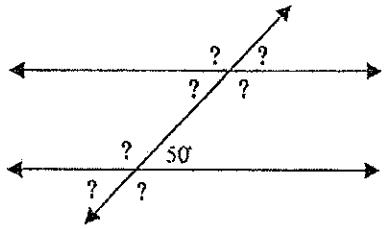
Example: Given an angle of 150°



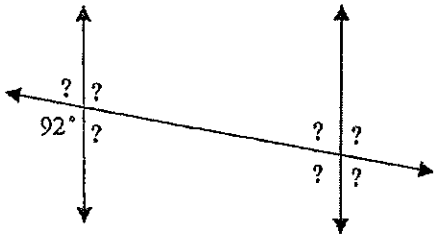
1)



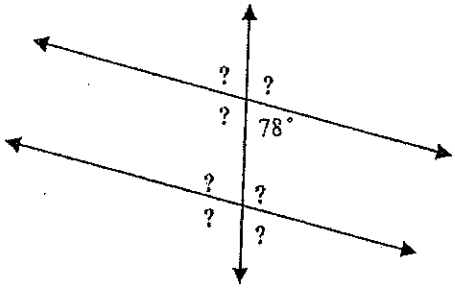
2)



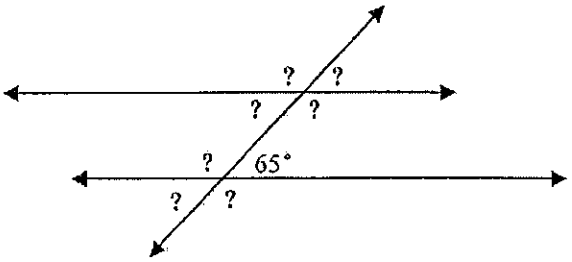
3)



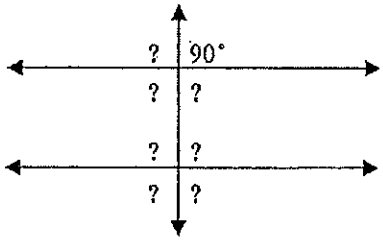
4)



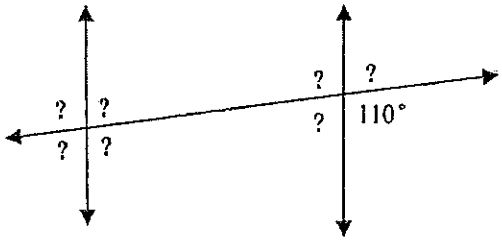
5)



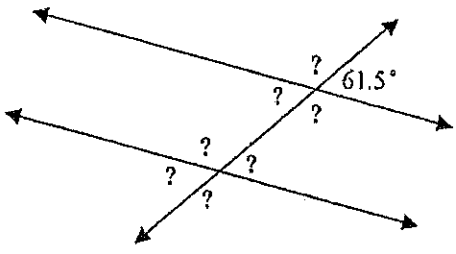
6)



7)



8)



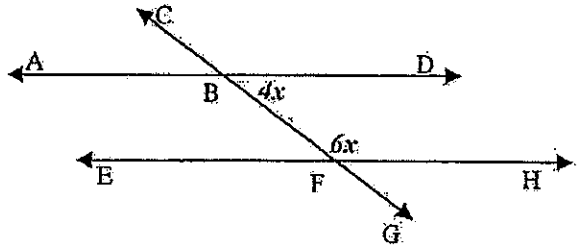
Name_____

Lesson 9-2

FINDING UNKNOWN ANGLE MEASURES—MIXED ANGLES

Directions: Find the measure of each missing angle in the parallel lines and transversals below. Each pair of angles is either *supplementary* or *congruent* to each other. All you have to do is set up and solve the appropriate equation for each situation. Once you've solved for x, plug that value back into each expression to find the measure of each angle.

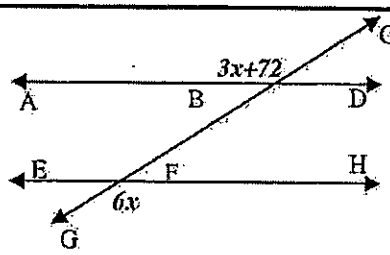
1)



Equation: _____

$x =$ _____ $\angle HFC =$ _____ $\angle DBG =$ _____

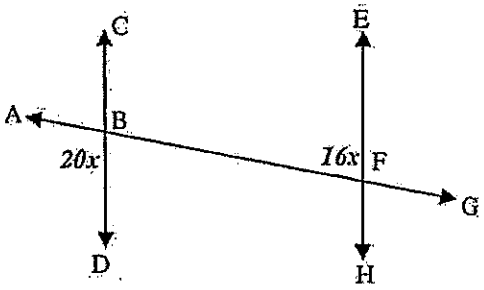
2)



Equation: _____

$x =$ _____ $\angle ABC =$ _____ $\angle GFH =$ _____

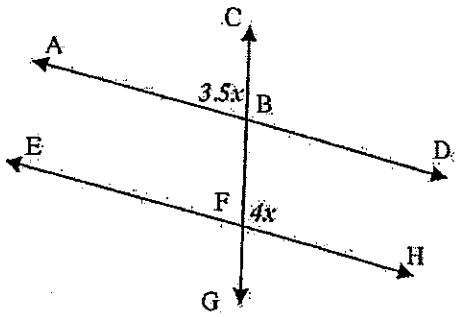
3)



Equation: _____

$x =$ _____ $\angle ABD =$ _____ $\angle AFE =$ _____

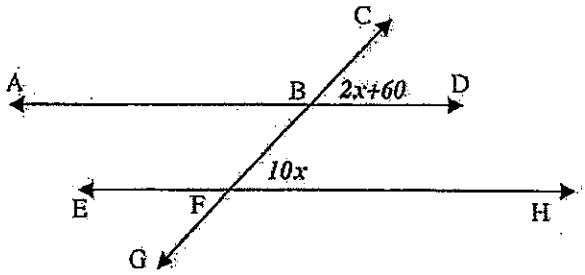
4)



Equation: _____

$x =$ _____ $\angle CBA =$ _____ $\angle CFH =$ _____

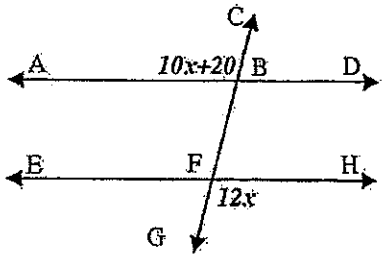
5)



Equation: _____

$x =$ _____ $\angle CFH =$ _____ $\angle CBD =$ _____

6)



Equation: _____

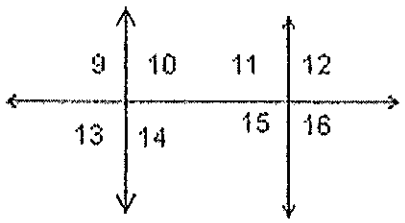
$x =$ _____ $\angle ABC =$ _____ $\angle GFH =$ _____

Lesson 9-2

Worksheet #3 (Parallel Lines Cut by a Transversal)

Name: _____ Date: _____ Period: _____

Use the figure at the right to answer problems 1- 8.



Classify each pair of angles as one of the following:

(a) alternate interior angles (b) corresponding angles

(c) alternate exterior angles (d) vertical angles

(e) supplementary angles (f) none

1. _____ ∠9 & ∠16

2. _____ ∠15 & ∠11

3. _____ ∠10 & ∠15

4. _____ ∠12 & ∠15

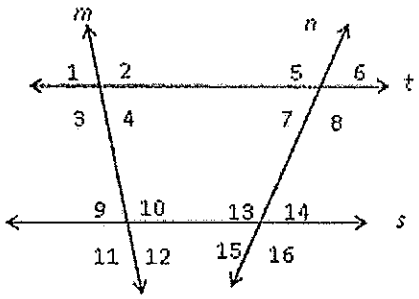
5. _____ ∠9 & ∠11

6. _____ ∠9 & ∠15

7. _____ ∠13 & ∠14

8. _____ ∠14 & ∠11

9. $m\angle 2 = 97°$ $m\angle 6 = 83°$



$m\angle 3$ = _____ $m\angle 5$ = _____

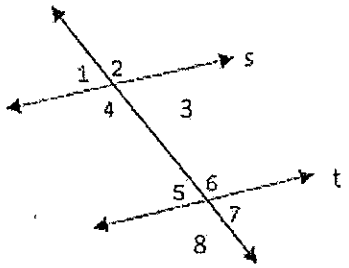
$m\angle 10$ = _____ $m\angle 7$ = _____

$m\angle 9$ = _____ $m\angle 16$ = _____

Find the value of x given that s // t

10. $m\angle 4 = 77°$, $m\angle 8 = 4x + 57$

11. $m\angle 3 = 5x + 13$, $m\angle 5 = 53°$

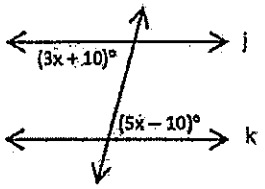


12. $m\angle 1 = 6x - 5$, $m\angle 7 = 115°$

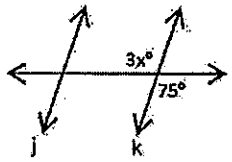
12

Find the value of x that makes j ∥ k.

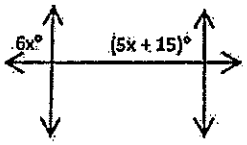
13.



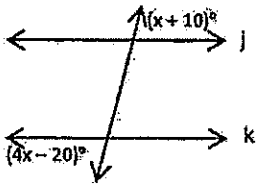
14.



15.

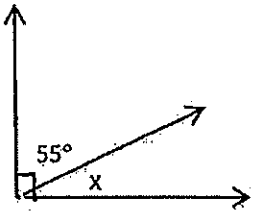


16.

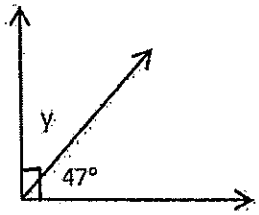


Determine the missing angles.

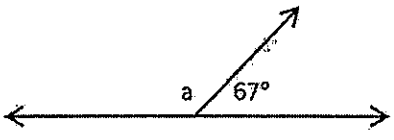
17.



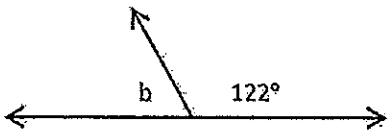
18.



19.



20.

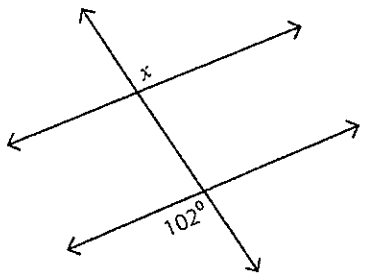


Name : _____

Angles in Transversal

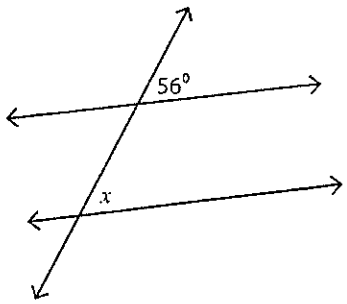
Find the value of x. * Also, state the relationship between angles.

1)



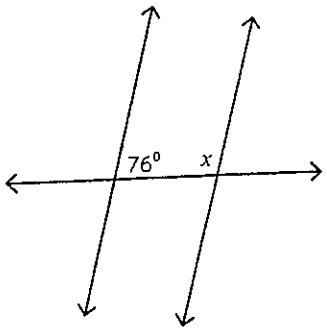
$x =$ _____

2)



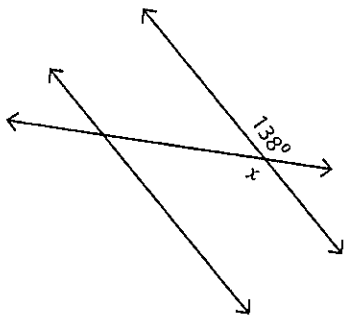
$x =$ _____

3)



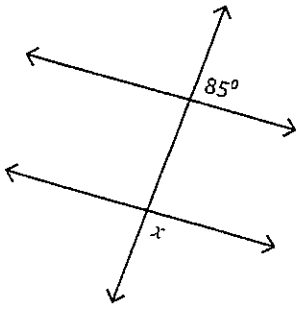
$x =$ _____

4)



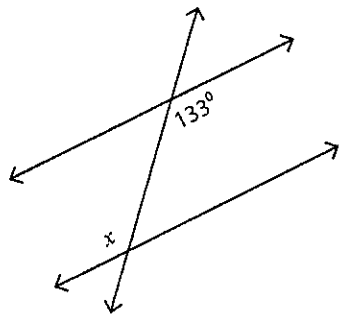
$x =$ _____

5)



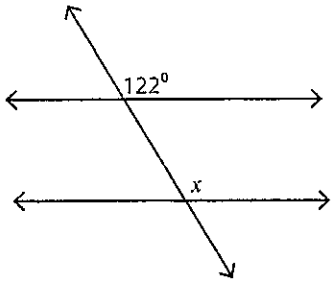
$x =$ _____

6)



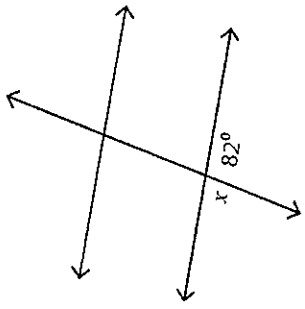
$x =$ _____

7)



$x =$ _____

8)



$x =$ _____

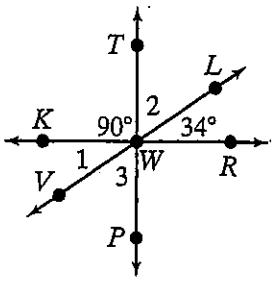
14

Name _____ Class _____ Date _____

Practice 9-2

Angle Relationships and Parallel Lines

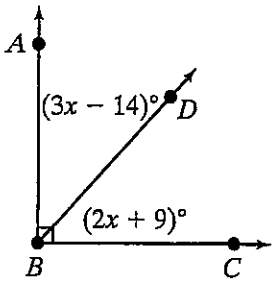
Find the measure of each angle in the figure at the right.



1. $m\angle 1$ _____ 2. $m\angle 2$ _____

3. $m\angle 3$ _____ 4. $m\angle VWR$ _____

Use the figure at the right for Exercises 5-8.



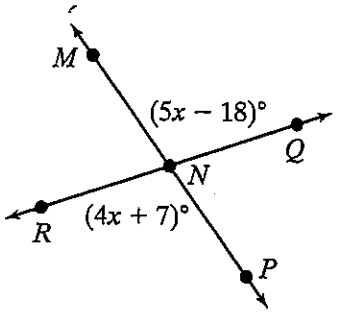
5. Write an equation. _____

6. Find the value of x. _____

7. Find $m\angle ABD$. _____

8. Find $m\angle DBC$. _____

Use the figure at the right for Exercises 9-12.



9. Write an equation. _____

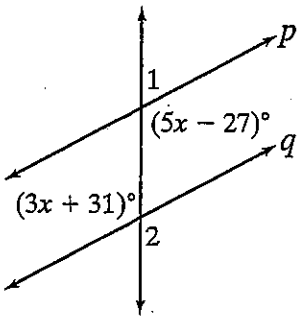
10. Find the value of x. _____

11. Find $m\angle MNQ$. _____

12. Find $m\angle MNR$. _____

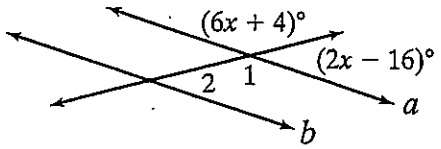
In each figure, find the measures of ∠1 and ∠2.

13. Given $p \parallel q$.



$m\angle 1$ = _____ $m\angle 2$ = _____

14. Given $a \parallel b$.



$m\angle 1$ = _____ $m\angle 2$ = _____

15. Find a pair of complementary angles such that the difference of their measures is 12°.

_____

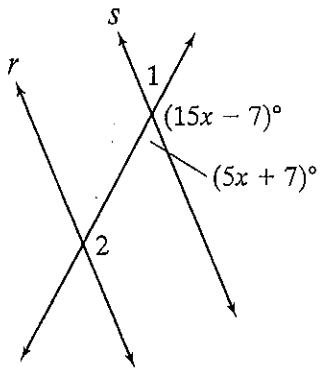
15

Name _____ Class _____ Date _____

Reteaching 9-2

Angle Relationships and Parallel Lines

Find the measures of $\angle 1$ and $\angle 2$. Given: $r \parallel s$.
Write an equation and solve for x.



$(5x + 7) + (15x - 7) = 180$ These angles are supplementary.

$5x + 15x + 7 - 7 = 180$ Simplify.

$20x = 180$ Simplify.

$\frac{20x}{20} = \frac{180}{20}$ Divide each side by 20.

$x = 9$ Simplify.

Find the measure of the angle marked $(5x + 7)°$ by substituting $x = 9$.

$5x + 7 = 5(9) + 7 = 45 + 7 = 52$

Since this angle and $\angle 1$ are vertical, they have the same measure.

Thus, $m\angle 1 = 52°$.

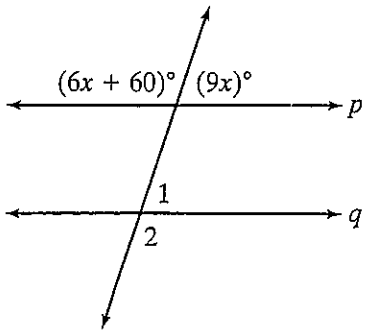
We can find the measure of $\angle 2$ several ways. The angle marked $(15x - 7)°$ and $\angle 2$ are corresponding angles, so they have the same measure. We can find this measure by substituting $x = 9$ into $15x - 7$ or by realizing that this angle and $\angle 1$ are supplementary.

$180 - 52 = 128$

$15x - 7 = 15(9) - 7 = 135 - 7 = 128$

Either way, $m\angle 2 = 128°$.

Use the figure at the right.



Given: $p \parallel q$.

1. Write an equation.

   _____

2. Find the value of x.

   $x =$ _____

3. Find $m\angle 1$.

   $m\angle 1 =$ _____

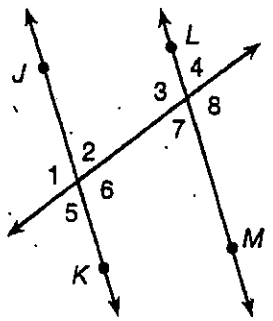
4. Find $m\angle 2$.

   $m\angle 2 =$ _____

Name_____ Period_____

Practice

Use figure at right to answer Exercises 9–16.
$\overleftrightarrow{JK} \parallel \overleftrightarrow{LM}$. If $m\angle 2 = 70°$, find each angle measure.



1. $m\angle 4$ _____ 2. $m\angle 7$ _____

3. $m\angle 5$ _____ 4. $m\angle 3$ _____

Match each pair of angles with the angle classification.

5. $\angle 6$ and $\angle 8$ _____
6. $\angle 3$ and $\angle 6$ _____
7. $\angle 4$ and $\angle 7$ _____
8. $\angle 1$ and $\angle 8$ _____

A. alternate interior angles

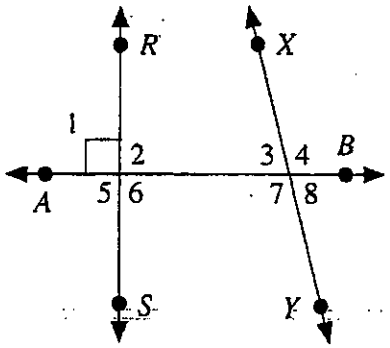
B. alternate exterior angles

C. corresponding angles

D. vertical angles

Use the figure at the right. Tell whether the given angles are a pair of corresponding angles or alternate interior angles.

9. $\angle 1$ and $\angle 3$
10. $\angle 2$ and $\angle 7$
11. $\angle 6$ and $\angle 3$
12. $\angle 4$ and $\angle 2$

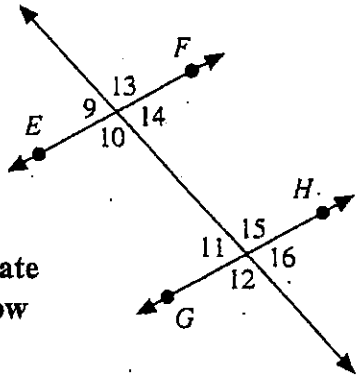


9._____
10._____
11._____
12._____

In the figure at the right, $\overleftrightarrow{EF} \parallel \overleftrightarrow{GH}$ and $m\angle 9 = 75°$. Find the measure of each angle.

13. $\angle 10$ 14. $\angle 11$ 15. $\angle 12$
16. $\angle 13$ 17. $\angle 14$ 18. $\angle 15$

« 19. **Draw a line parallel to the transversal and state how many angles are *congruent* to $\angle 9$ and how many angles are *supplementary* to $\angle 12$.**

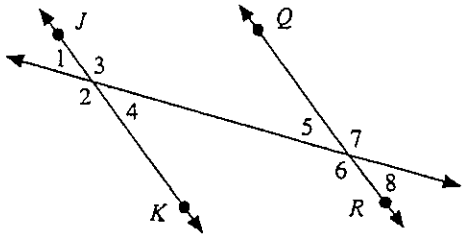


13._____
14._____
15._____
16._____
17._____
18._____
19._____

_____

17

Use the figure at the right and tell whether each pair of angles are adjacent(A), Vertical(V), corresponding(C), or Alternate interior angles(AI).



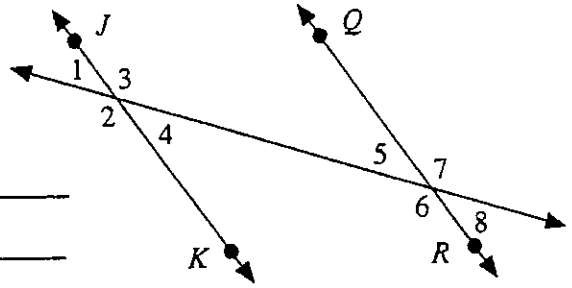
20. $\angle 8$ and $\angle 5$ _____ 21. $\angle 1$ and $\angle 3$ _____

22. $\angle 8$ and $\angle 4$ _____ 23. $\angle 3$ and $\angle 6$ _____

24. $\angle 6$ and $\angle 8$ _____ 25. $\angle 3$ and $\angle 7$ _____

26. $\angle 7$ and $\angle 6$ _____ 27. $\angle 2$ and $\angle 6$ _____

In the figure at the right, $\overleftrightarrow{JK} \parallel \overleftrightarrow{QR}$ and $m\angle 7 = 143°$. Find the measure of each angle.



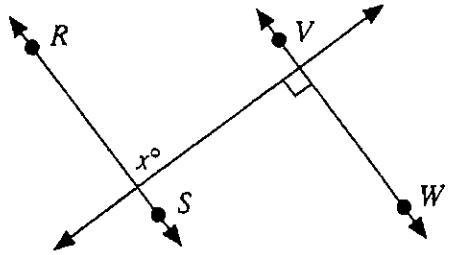
28. $\angle 1$ _____ 29. $\angle 2$ _____

29. $\angle 3$ _____ 30. $\angle 4$ _____

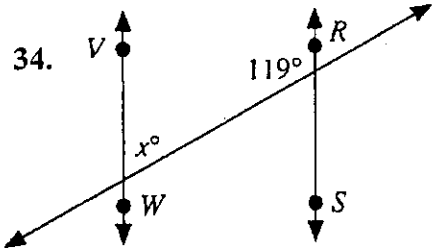
31. $\angle 5$ _____ 32. $\angle 6$ _____

In each figure, $\overleftrightarrow{RS} \parallel \overleftrightarrow{VW}$. Find the value of x.

33.



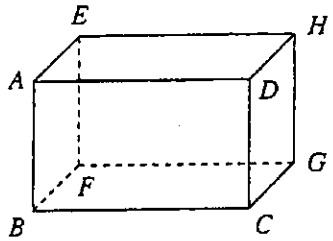
34.



33. _____

34. _____

35. The figure at the right represents a box, similar to an ordinary packing carton. Classify each pair of line segments as *parallel*, *perpendicular*, or *skew*.



a. $\overline{AB}$ and $\overline{DC}$ b. $\overline{EF}$ and $\overline{DH}$

c. $\overline{CG}$ and $\overline{FG}$ d. $\overline{AB}$ and $\overline{GH}$

35. _____

_____

_____

_____

36. Determine whether the following statement is true or false.
Any two lines in space are related in exactly one of these ways: the lines either intersect, they are parallel, or they are skew.

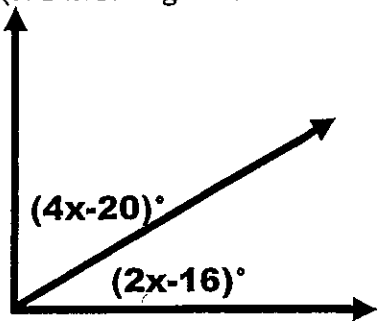
36. _____

Section 9-2 Worksheet

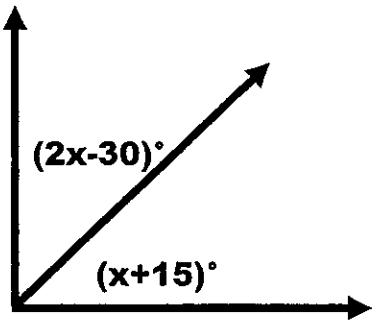
Name _____
Period _____

Directions: Write an equation for each figure and solve for x. Then, find the measure of each angle. (***NOTE***: Figures are not drawn to scale).

1)

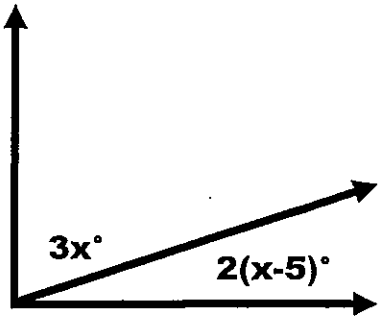


2)

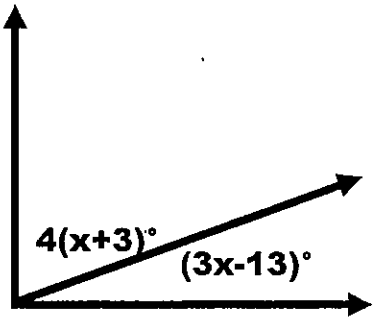


#1-4 are right angles

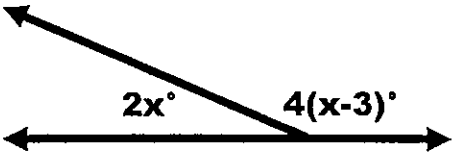
3)



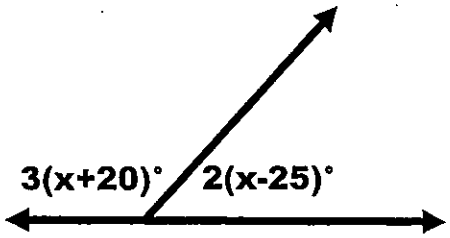
4)



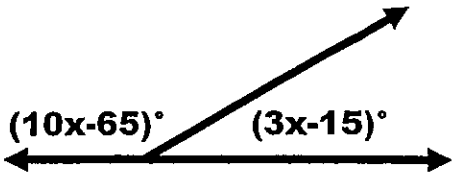
5)



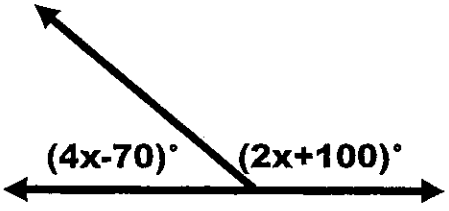
6)



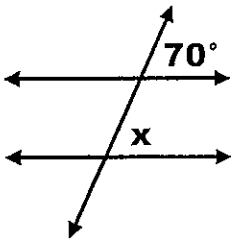
7)



8)

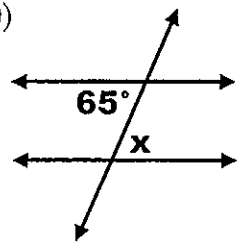


Directions: Give the measure of angle x and the relationship between the two angles.

9) 

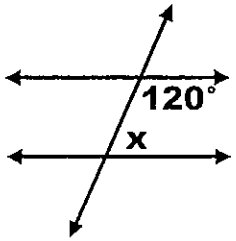
$x =$ _____

_____

10) 

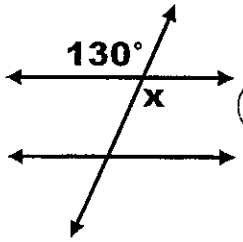
$x =$ _____

_____

11) 

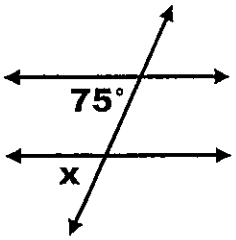
$x =$ _____

_____

12) 

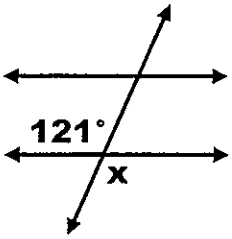
$x =$ _____

_____

13) 

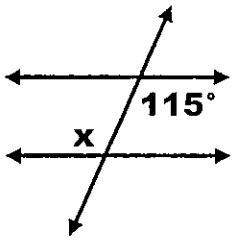
$x =$ _____

_____

14) 

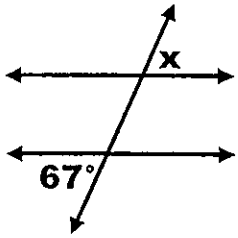
$x =$ _____

_____

15) 

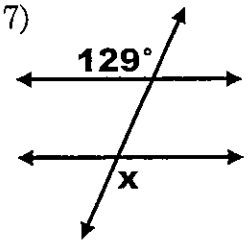
$x =$ _____

_____

16) 

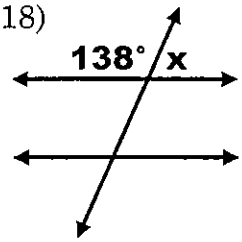
$x =$ _____

_____

17) 

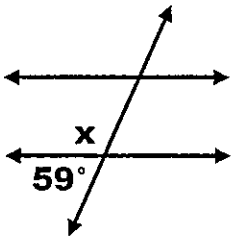
$x =$ _____

_____

18) 

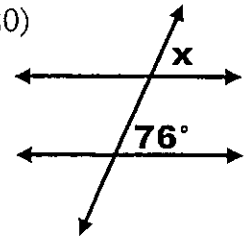
$x =$ _____

_____

19) 

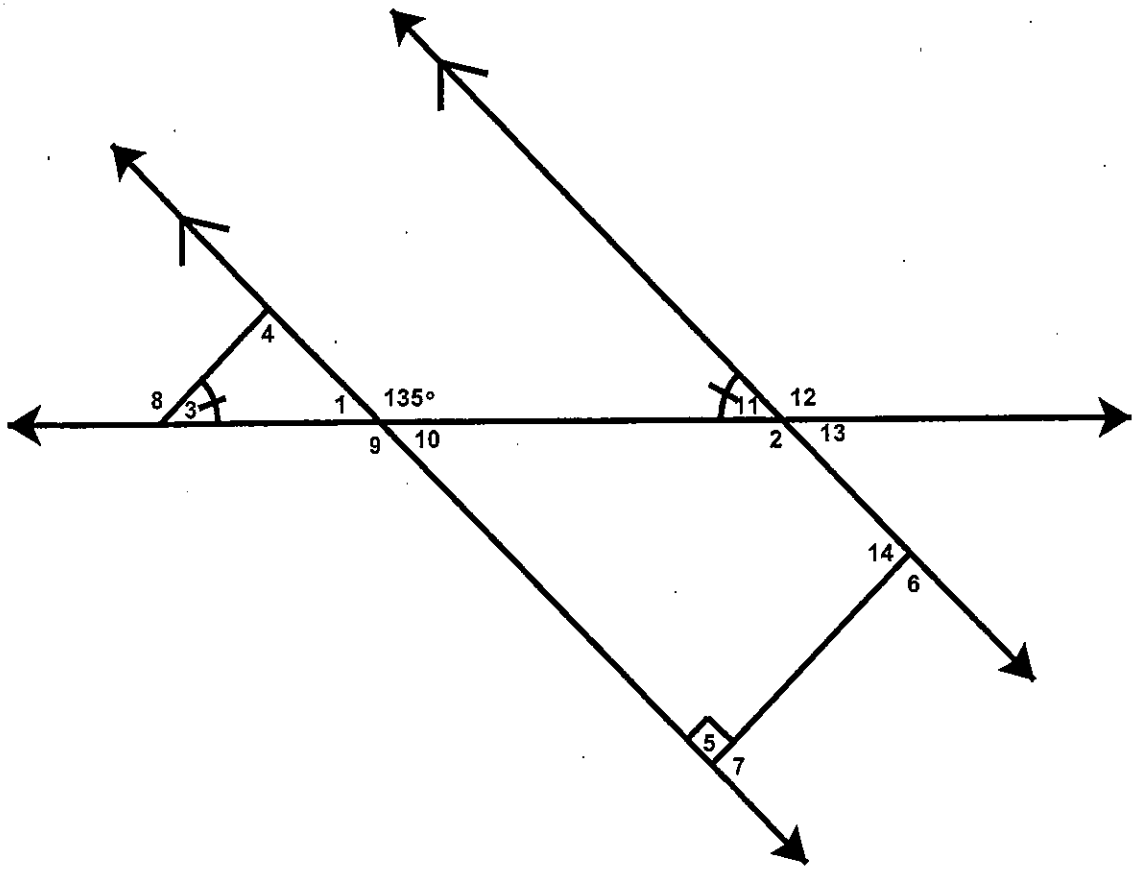
$x =$ _____

_____

20) 

$x =$ _____

_____



m∠ 1 = _____

m∠ 2 = _____

m∠ 3 = _____

m∠ 4 = _____

m∠ 5 = _____

m∠ 6 = _____

m∠ 7 = _____

m∠ 8 = _____

m∠ 9 = _____

m∠ 10 = _____

m∠ 11 = _____

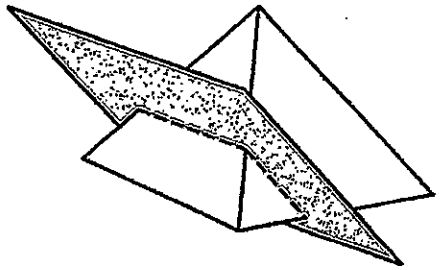
m∠ 12 = _____

m∠ 13 = _____

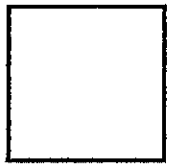
m∠ 14 = _____

CROSS-SECTIONS

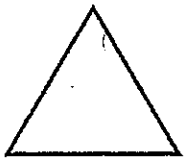
(1) A square pyramid is cut along the shaded plane shown below.



Which of the following is the cross-section of this solid?

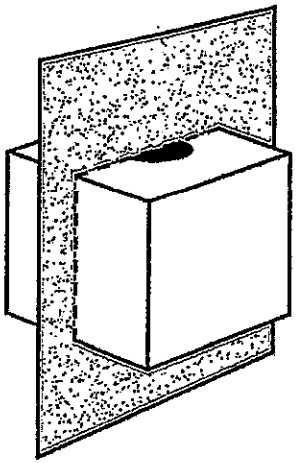
Ⓐ 

Ⓑ 

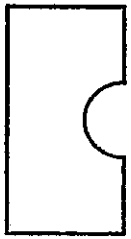
Ⓒ 

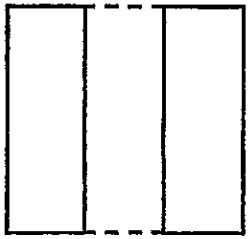
Ⓓ 

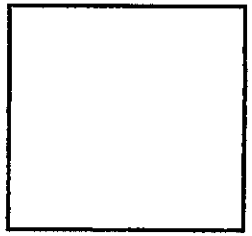
(2) A cube with a cylinder cut from its center is cut along the plane shown below.

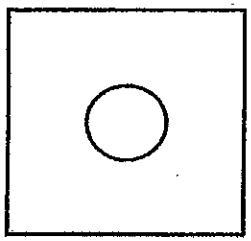


Which of the following is the cross-section of this solid?

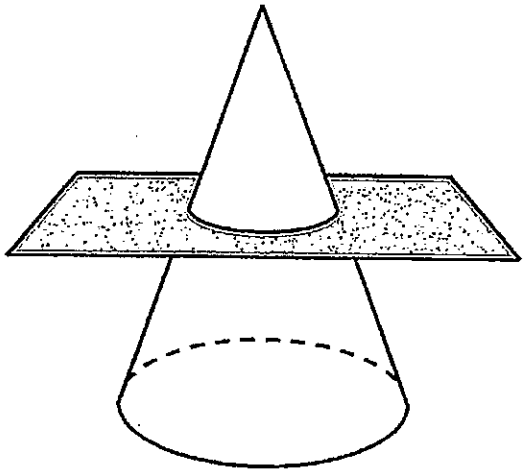
Ⓕ 

Ⓗ 

Ⓖ 

Ⓙ 

(3) A cross-section is cut from the circular cone below.



What is the shape of the cross-section?

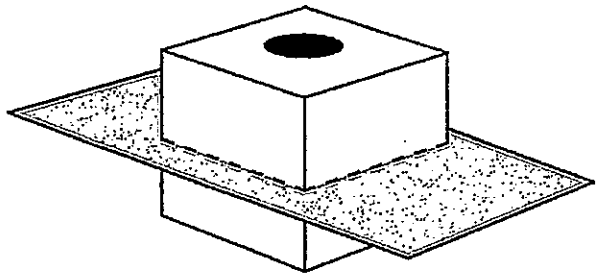
Ⓐ Square

Ⓑ Semicircle

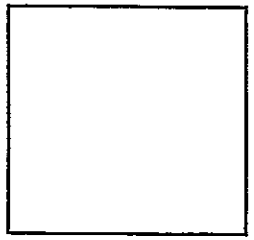
Ⓒ Triangle

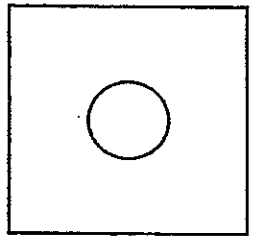
Ⓓ Circle

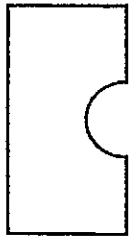
(4) A cube with a cylinder cut from its center is cut along the plane shown below.

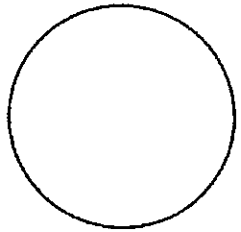


Which of the following is the cross-section of this solid?

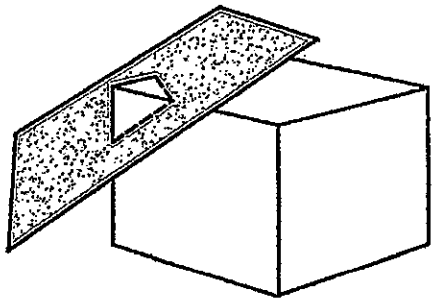
Ⓕ 

Ⓗ 

Ⓖ 

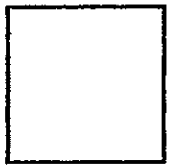
Ⓙ 

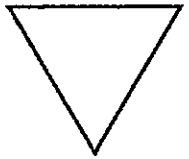
(5) A rectangular prism is cut along the shaded plane shown below.

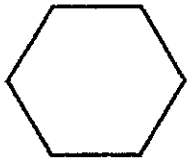


Which of the following is the cross-section of this solid?

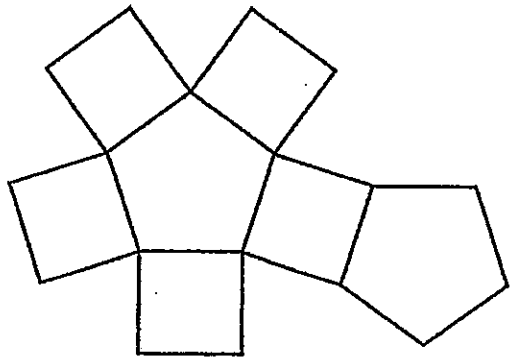
Ⓕ 

Ⓖ 

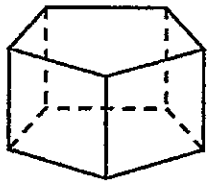
Ⓗ 

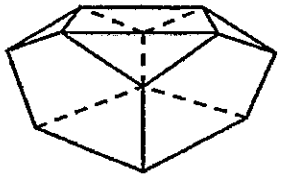
Ⓙ 

(6) The net of a specific polyhedron is shown below.

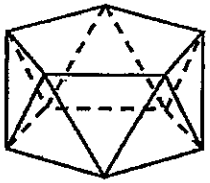


Which polyhedron is represented by this net?

Ⓕ 

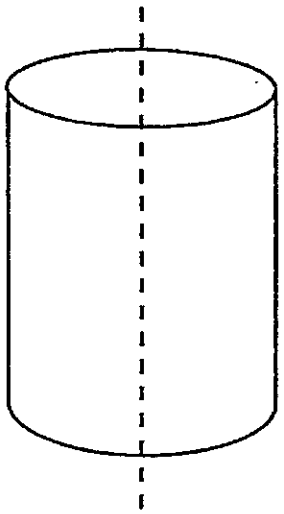
Ⓖ 

Ⓗ 

Ⓙ 

(7)

A cross-section is cut from the cylinder below.



What is the shape of the cross-section?

Ⓐ Rectangle

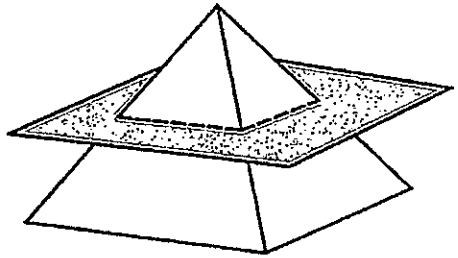
Ⓑ Circle

Ⓒ Semicircle

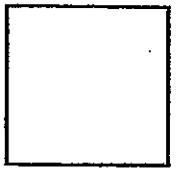
Ⓓ Oval

(8)

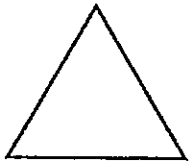
A square pyramid is cut along the shaded plane shown below.



Which of the following is the cross-section of this solid?

Ⓕ 

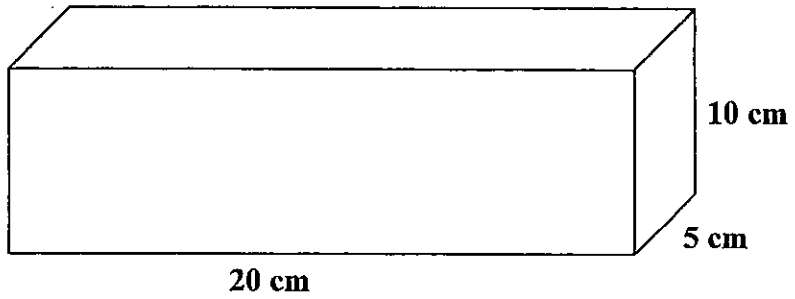
Ⓖ 

Ⓗ 

Ⓙ 

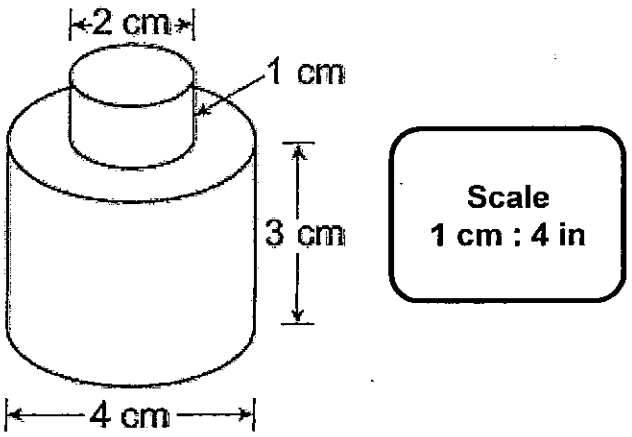
(9)

A carpenter will make a single, straight cut through the rectangular prism shown below by randomly choosing a face and cutting parallel to that face. The cut will be a whole number of centimeters from the chosen face.



What is the probability that the area, in square centimeters, of the cross section created by the cut will not be a multiple of 100?

(10) A machine part consists of two cylinders aligned along the same vertical axis. A scale drawing of the part is represented below. The part is cut in half through the vertical axis. What is the total area, in square inches, of the actual two-dimensional cross-section that is the result of the cut?



Scale
1 cm : 4 in

27

Objective:

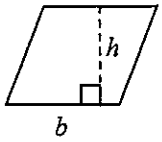
Vocabulary

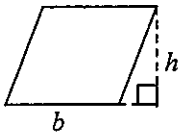
	Definition
Area	
Altitude	

Key Concepts – Area of a Parallelogram

The area of a parallelogram is the product of any base length b and the corresponding *perpendicular* height h.

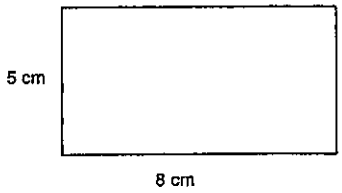
$$A = bh$$



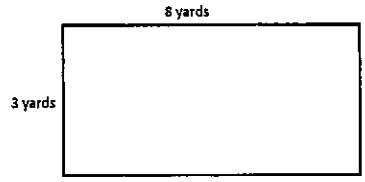


Example 1: Find the area of each rectangle.

(a)

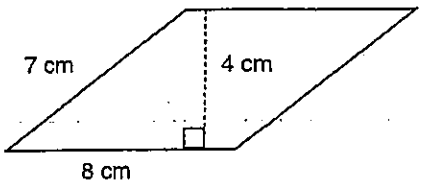


(b)

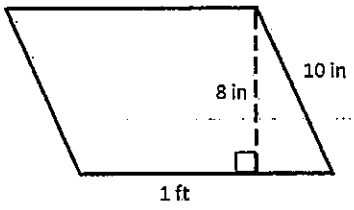


Example 2: Find the area of each parallelogram.

(a)



(b)



Wrap It Up:

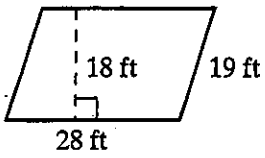
How do the areas of two parallelograms compare when the dimensions of one are twice the dimensions of the other?

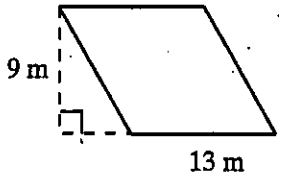
Name _____ Class _____ Date _____

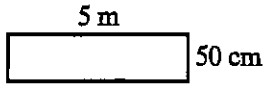
Practice 10-1

Area: Parallelograms

Find the area of each parallelogram.

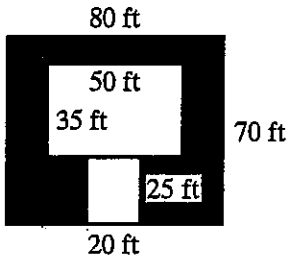
1. 

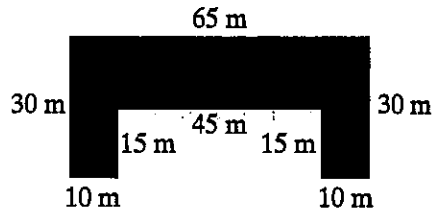
2. 

3. 

_____ _____ _____

Find the area of each shaded region. Assume that all angles that appear to be right angles are right angles.

4. 

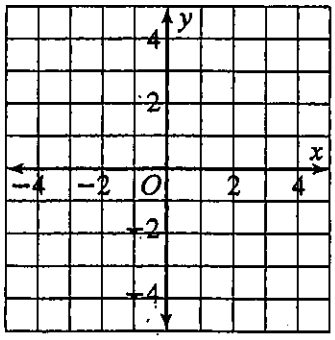
5. 

_____ _____

The vertices of a parallelogram are given. Draw each parallelogram. Find its area.

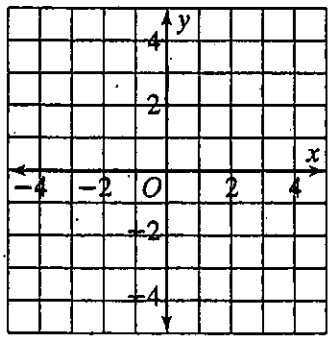
6. $P(1, 1), Q(3, 1), R(2, 4), S(4, 4)$

_____



7. $J(-3, 2), K(1, 2), M(-1, -3), L(3, -3)$

_____



8. The perimeter of a square is 72 in. What is its area?

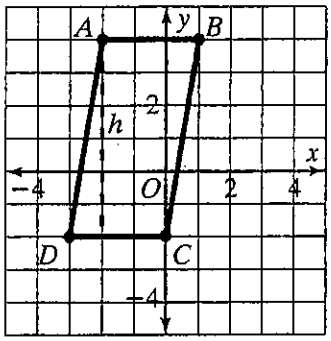
_____

Name _____ Class _____ Date _____

Reteaching 10-1

Area: Parallelograms

Draw the parallelogram with vertices $A(-2, 4)$, $B(1, 4)$, $C(0, -2)$, and $D(-3, -2)$. Find its area.



Plot the four points and connect them to form the parallelogram. To find the area, find the length of a base and the height to that base. Any one of the four sides could be used as the base. The easiest side to use is $\overline{DC}$.

Count in the figure.

$DC = 3$ units, so $b = 3$.

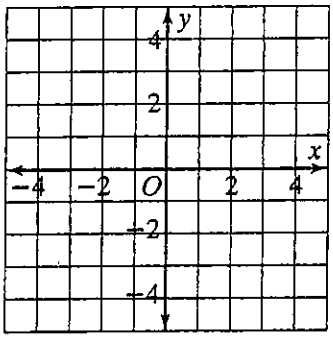
Draw the height as a dashed line from A, perpendicular to $\overline{DC}$.

Count in the figure, $h = 6$.

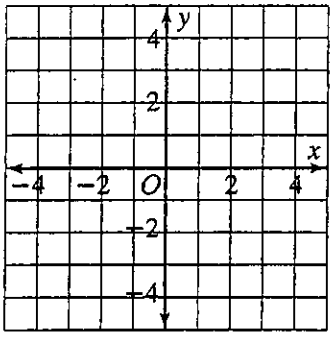
So $A = bh = 3(6) = 18$ units^2.

The vertices of a parallelogram are given. Draw each parallelogram. Find its area.

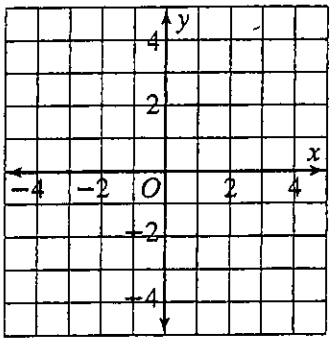
1. $E(-1, 2)$, $F(3, 2)$, $G(1, 1)$, $H(-3, 1)$



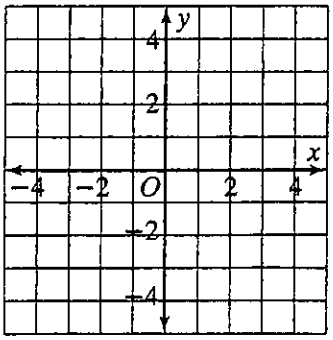
2. $M(-2, 1)$, $N(2, 1)$, $Q(-3, -2)$, $P(1, -2)$



3. $R(1, 3)$, $S(3, 3)$, $U(-1, -4)$, $T(1, -4)$



4. $V(-3, -1)$, $W(5, -1)$, $Y(-4, -3)$, $X(4, -3)$



32

Objective:

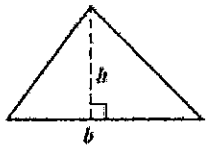
Vocabulary

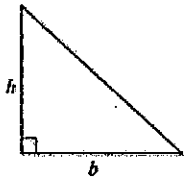
	Definition
Altitude of a triangle	

Key Concepts – Area of a Triangle

The area of a triangle equals half the product of any base length b and the corresponding height h.

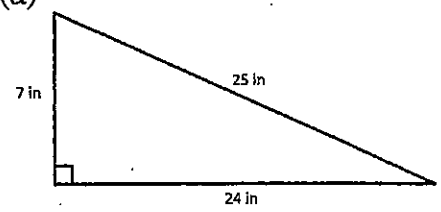
$$A = \frac{1}{2}bh$$



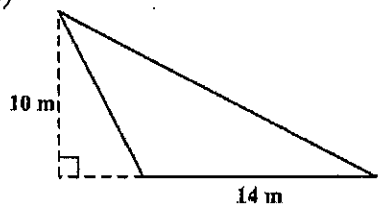


Example 1: Find the area of each triangle.

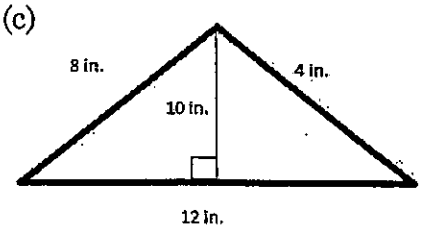
(a)



(b)

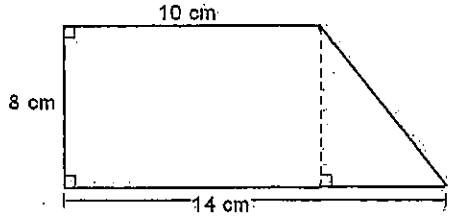


(c)

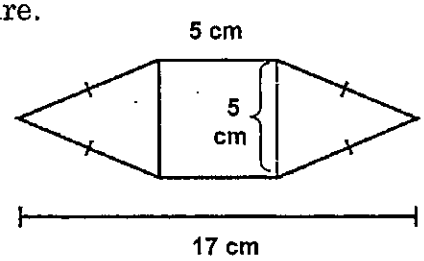


Example 2: Find the area of each composite figure.

(a)



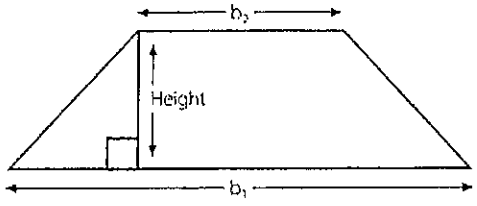
(b)



Key Concepts – Area of a Trapezoid

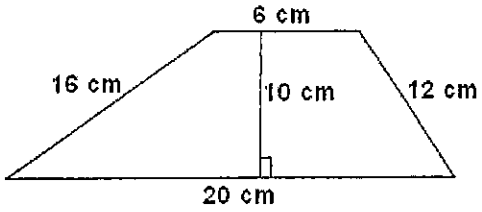
The area of a trapezoid is half the product of the height and the sum of the lengths of the bases.

$$A = \frac{1}{2}h(b_1 + b_2)$$

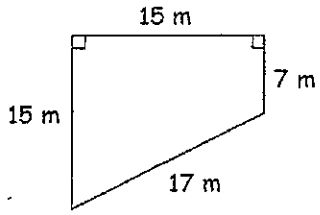


Example 3: Find the area of each trapezoid.

(a)



(b)



Wrap It Up:

What is the difference between the area of a triangle and the area of a trapezoid?

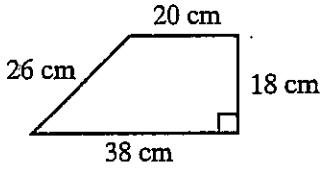
Name _____ Class _____ Date _____

Practice 10-2

Area: Triangles and Trapezoids

Find the area of each trapezoid.

1.



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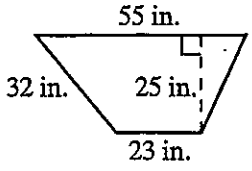
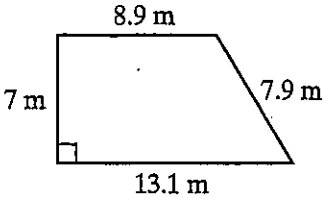
2.



_____

3.



_____

4. $base_1$ = 13 in.
$base_2$ = 8 in.
height = 5 in.

_____

5. $base_1$ = 24.6 cm
$base_2$ = 9.4 cm
height = 15 cm

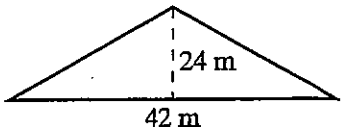
_____

6. $base_1$ = 2.25 ft
$base_2$ = 4.75 ft
height = 3.5 ft

_____

Find the area of each triangle.

7.



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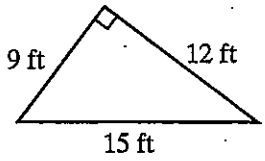
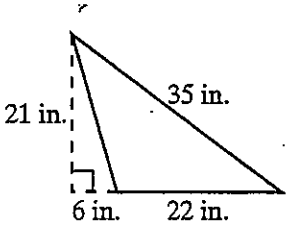
8.



_____

9.



_____

10. base = 24 in.
height = 9 in.

area = _____

11. height = 27 cm
base = 34 cm

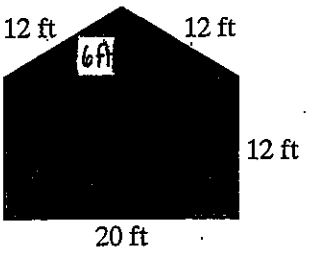
area = _____

12. base = 40 ft
height = 8.25 ft

area = _____

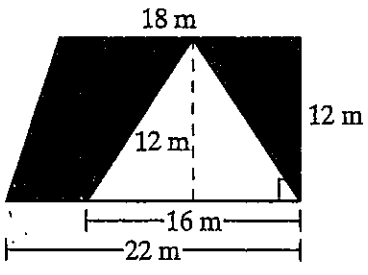
Find the area of each shaded region.

13.



_____

14.



_____

15. A triangle has an area of 36 cm^2 and a base of 6 cm. What is the height of the triangle?

_____

35

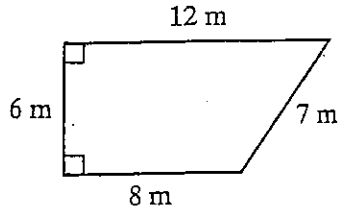
Name _____ Class _____ Date _____

Reteaching 10-2

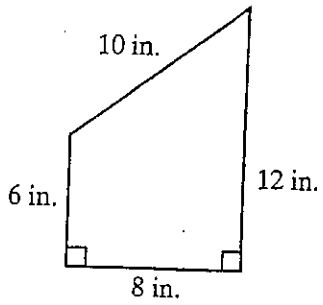
Area: Triangles and Trapezoids

Find the area of each trapezoid.

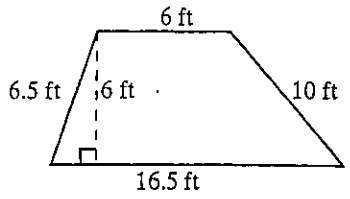
1.



2.



3.



4. $b_1 = 25$ cm
$b_2 = 18$ cm
$h = 12$ cm

5. $b_1 = 4$ ft
$b_2 = 7$ ft
$h = 5$ ft

6. $b_1 = 85$ mm
$b_2 = 73$ mm
$h = 48$ mm

7. $b_1 = 1.5$ in.
$b_2 = 3.5$ in.
$h = 4.5$ in.

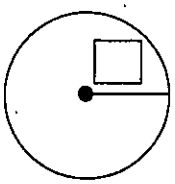
8. $b_1 = 50$ m
$b_2 = 60$ m
$h = 40$ m

9. $b_1 = 12.4$ km
$b_2 = 8.8$ km
$h = 9$ km

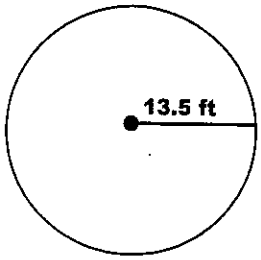
Objective:

Area of a Circle

$A =$



Example 1: Find the area of the circle.

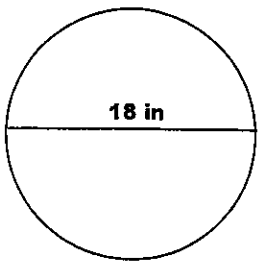


Write the formula:

Substitute 3.14 for π and the radius for r :

Simplify:

Example 2: Find the area of the circle.

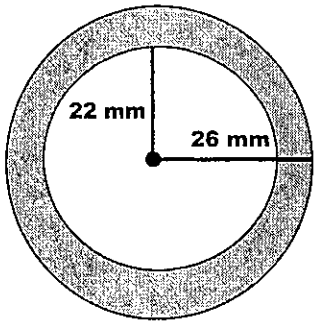


Write the formula:

Substitute 3.14 for π and the radius for r :

Simplify:

Example 3: Find the area of the shaded region.



- Find the area of the larger circle

- Find the area of the smaller circle

- Subtract the area of the smaller circle from the larger one to get the area of the shaded region.

Example 4: Find the area of the figure.

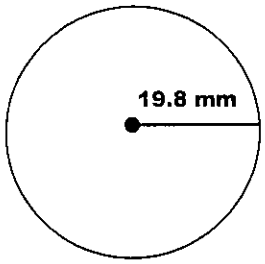
Write the formula:

Substitute 3.14 for π and the radius for r :

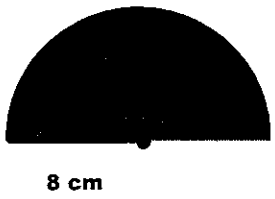
Simplify:

Example 5: Find the area of each figure.

1)



2)



3)

Example 6: Sandy's dog has a 40 ft chain that is connected to a stake in the middle of the yard. How many square feet does her dog have to move around? First, draw a figure. Then, find the area.

Example 7: You can buy a 10-in diameter pizza for $6.50, a 12-in pizza for $8.50, or a 14-in pizza for $10.50.

a) What is the area of each pizza to the nearest square inch?

10-in: _____

12-in: _____

14-in: _____

b) What is the price per square inch of each pizza? (Hint: Divide the cost of each pizza by the area of each pizza?)

10-in: _____

12-in: _____

14-in: _____

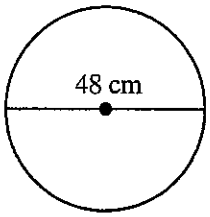
c) Which pizza has the lowest cost per square inch? _____

Name _____ Class _____ Date _____

Reteaching 10-3

Area: Circles

Find the area of the circle. Give an exact area and an approximate area.



The formula for the area A of a circle is $A = \pi r^2$, where r is the radius of the circle and π is a number that is close to 3.14, but not exactly 3.14.

In the circle shown, the diameter is 48 cm. The radius of any circle is half its diameter.

$\frac{1}{2} \cdot 48 = 24$

So, $r = 24$ cm.

$A = \pi r^2$

$A = \pi(24)^2$ Substitute 24 for r in the formula.

$A = 576\pi$ Simplify.

The exact area of the circle is 576π cm^2.

To find the approximate area, substitute 3.14 for π.

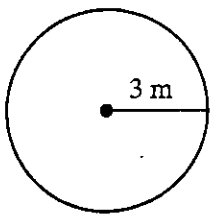
$A = 576\pi \approx 576(3.14) = 1{,}808.64$

Note: The symbol $\approx$ is read "is approximately equal to."

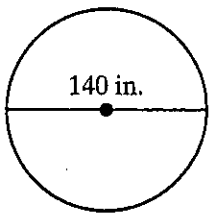
The approximate area is 1,808.64 cm^2.

Find the area of each circle.

1.



2.



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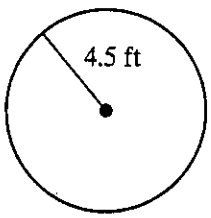


4. $r = 15$ cm

5. $d = 16$ in.

6. $d = 7$ m

7. $r = 3.4$ ft

8. $d = 29$ cm

9. $d = 284$ mi

Name _____ Class _____ Date _____

Practice 10-3

Area: Circles

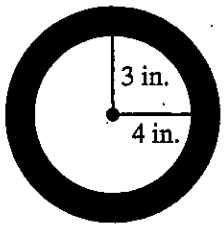
Find the area of each circle.

1. $r = 7$ m
2. $d = 18$ cm
3. $d = 42$ m
4. $r = 35$ km
5. $d = 22$ cm
6. $r = 25$ ft
7. $r = 3\frac{1}{2}$ mi
8. $d = 5$ in.
9. $d = 9.8$ mm

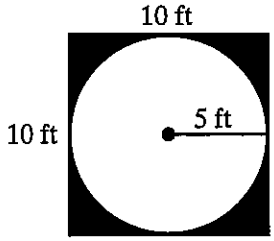
Find the area of each shaded region to the nearest tenth.

10.

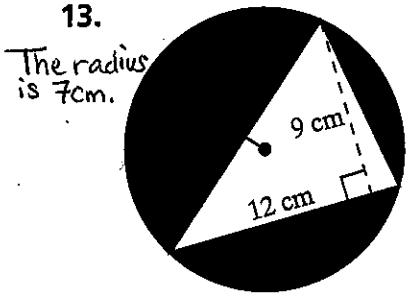
11.



12.



13.



14. A goat is tethered to a stake in the ground with a 5-m rope. The goat can graze to the full length of the rope a full 360° around the stake. How much area does the goat have in which to graze?

_____

41

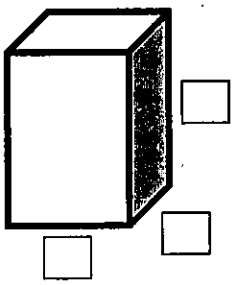
Objective:

Vocabulary:

Surface Area:

Surface Area of a Rectangular Prism

$SA =$

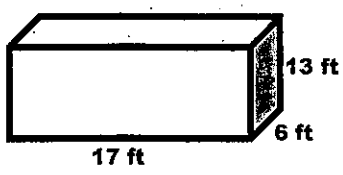


Example 1: Find the surface area of the prism.

Write the formula:

Substitute ___ for l ___ for w
and ___ for h:

Simplify:

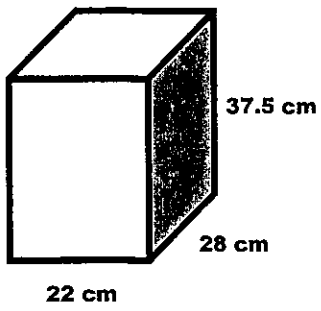


Example 2: Find the surface area of the prism.

Write the formula:

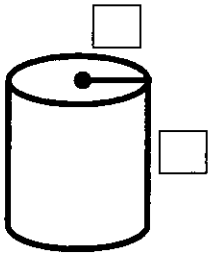
Substitute ___ for l ___ for w
and ___ for h:

Simplify:



Surface Area of a Cylinder

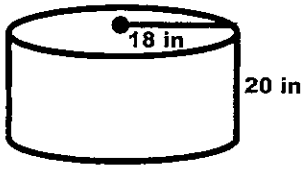
$SA =$



Example 3: Find the surface area of the cylinder.

Write the formula:

Substitute ___ for π ___ for r
and ___ for h:

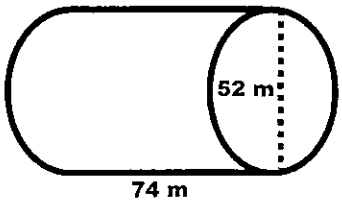


Simplify:

Example 4: Find the surface area of the cylinder.

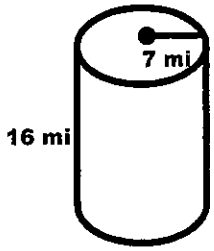
Write the formula:

Substitute ___ for π and ___ for r
and ___ for h:

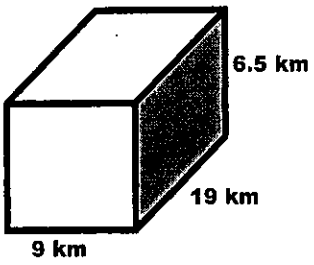


Simplify:

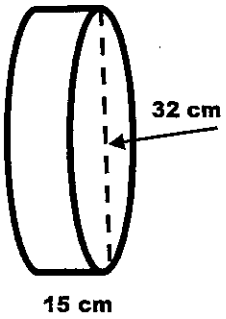
Example 5: Find the surface area of each figure.



b.

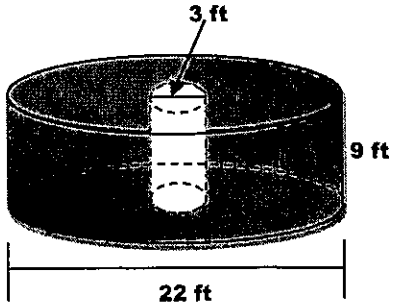


c.



Example 6:

a. There is a hole in the center of this cylinder. How much paint will you need to paint the entire surface except inside the hole?



b. A gallon of paint covers approximately 350 square feet. How many gallons will you need if you are going to paint two coats?

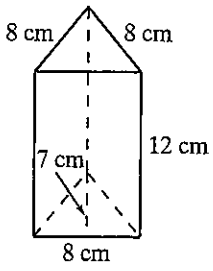
c. If the paint costs $21.50 per gallon, how much will it cost you?

Name _____ Class _____ Date _____

Reteaching 10-5

Surface Area: Prisms and Cylinders

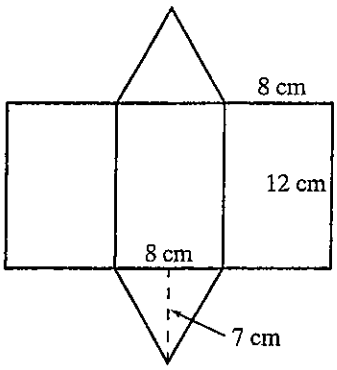
Find the surface area of the triangular prism.



Two methods can be used to find the surface area.

Method 1

Draw a net for the prism, find the area of each polygon in the net, and then add them together.



The triangles have area:

$A = \frac{1}{2}bh = \frac{1}{2}(8)7 = 28 \text{ cm}^2$

Each rectangle has area:

$A = bh = 8(12) = 96 \text{ cm}^2$

The total area of the 2 triangles and 3 rectangles is:

$28 + 28 + 96 + 96 + 96 = 344 \text{ cm}^2$

Method 2

Use the formula

S.A. = L.A. + $2B$

L.A. = ph

$p = 3(8) = 24$

L.A. = $24(12) = 288 \text{ cm}^2$

$B = \frac{1}{2}bh = \frac{1}{2}(8)(7) = 28 \text{ cm}^2$

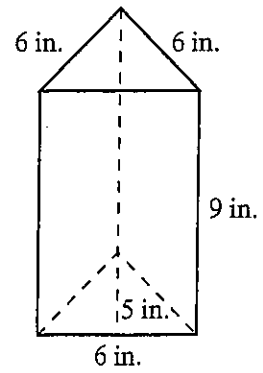
S.A. = L.A. + $2B$

$= 288 + 2(28)$

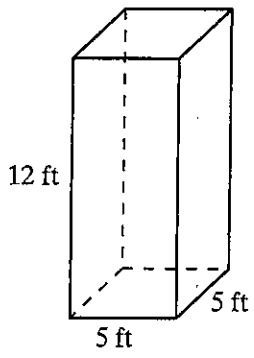
$= 344 \text{ cm}^2$

Find the surface area of each prism using the method you prefer.

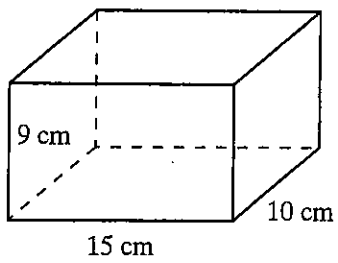
1.



2.



3.



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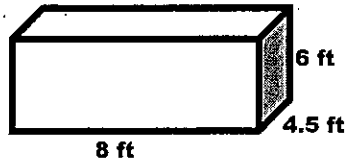
10-5 Practice Worksheet

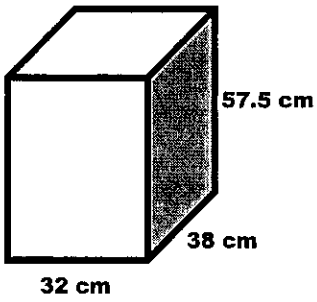
Name _____
Period ____

Find the surface area. To get credit, you must show FORMULAS and SUBSTITUTIONS!

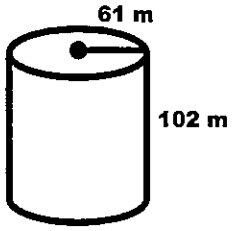
1)



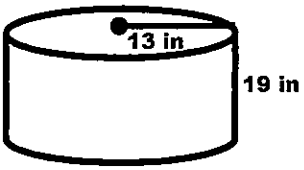
2)



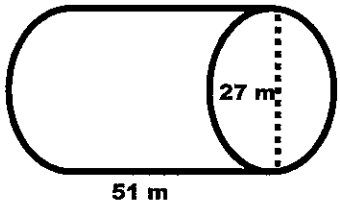
3)



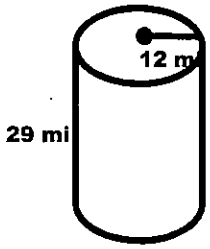
4)



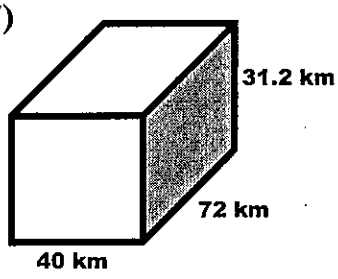
5)



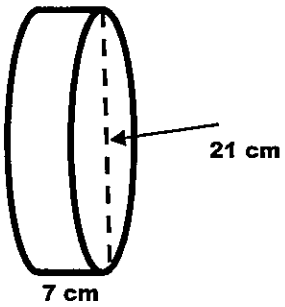
6)



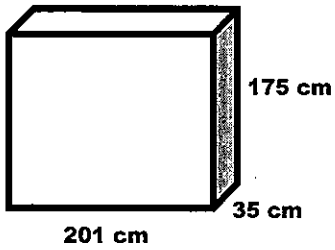
7)



8)



9)



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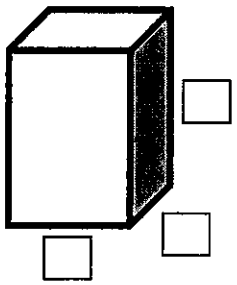
Objective:

Vocabulary:

Volume:

Volume of a Rectangular Prism

$V =$

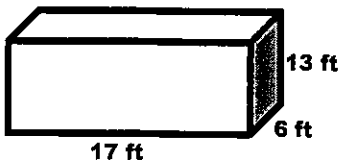


Example 1: Find the volume of the prism.

Write the formula:

Substitute ___ for l ___ for w
and ___ for h:

Simplify:

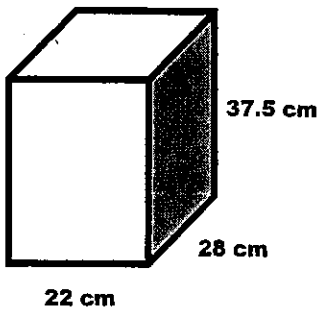


Example 2: Find the volume of the prism.

Write the formula:

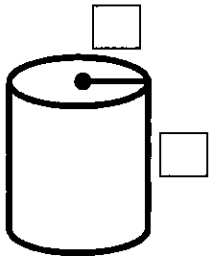
Substitute ___ for l ___ for w
and ___ for h:

Simplify:



Volume of a Cylinder

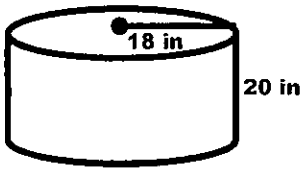
$V =$



Example 3: Find the volume of the cylinder.

Write the formula:

Substitute ___ for π ___ for r
and ___ for h:

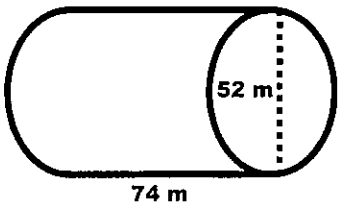


Simplify:

Example 4: Find the volume of the cylinder.

Write the formula:

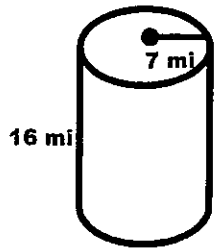
Substitute ___ for π and ___ for r
and ___ for h:



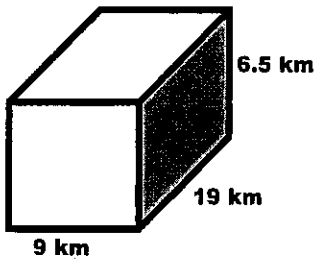
Simplify:

Example 5: Find the volume of each figure.

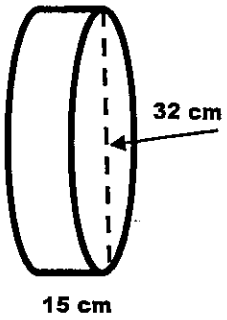
a.



b.

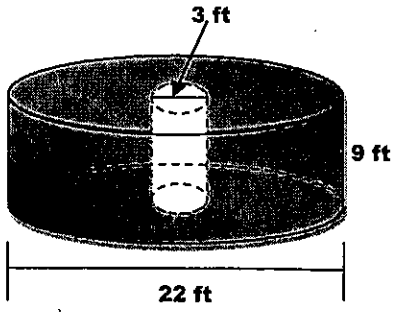


c.



Example 6:

a. There is a hole in the center of this cylinder. How much cement would you need to create this figure? (Hint: Find the volume.)



b. Cement is sold by the yard. How many cubic yards of cement would you need to create the figure? (Hint: 1 yd^3 = _____ ft^3)

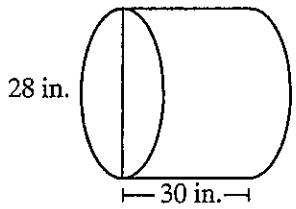
c. Cement costs $90 per cubic yard. How much will the figure cost you to create?

Name _____ Class _____ Date _____

Reteaching 10-7

Volume: Prisms and Cylinders

Find the volume of the cylinder.



$V = Bh$ Use the formula for volume.

$V = \pi r^2 h$ $B = \pi r^2$ since the base is a circle.

$r = \frac{1}{2}d = \frac{1}{2}(28)$ Find r from $d = 28$.

$= 14$

$V = \pi r^2 h$

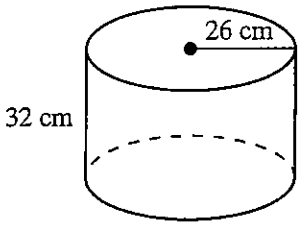
$V = \pi(14)^2(30)$ Substitute 14 for r and 30 for h.

$\approx 18{,}463.2$ Multiply. Use 3.14 for π.

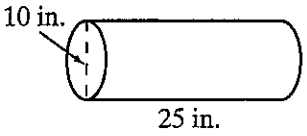
The volume is about 18,463 in.^{3}. Don't forget to use cubic units.

Find the volume of each prism or cylinder to the nearest cubic unit.

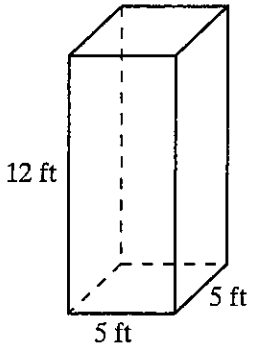
1.



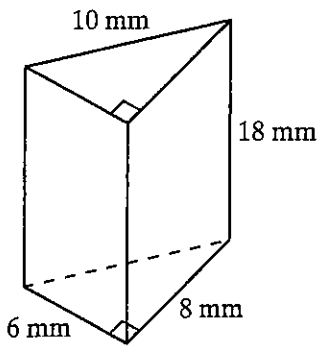
2.



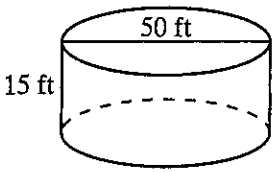
3.



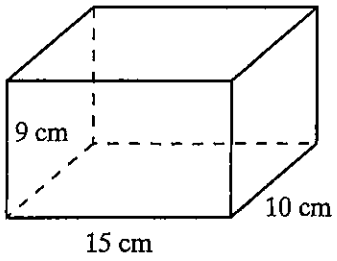
4.



5.



6.



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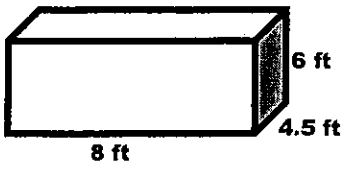
10-7 Practice Worksheet

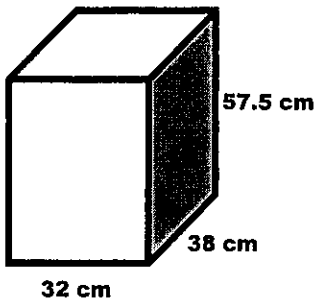
Name _____
Period ____

Find the volume. To get credit, you must show FORMULAS and SUBSTITUTIONS!

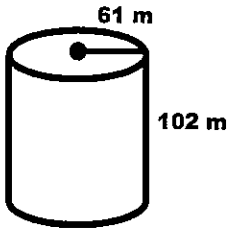
1)



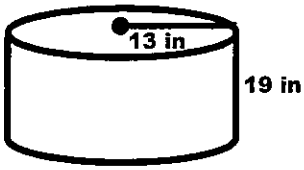
2)



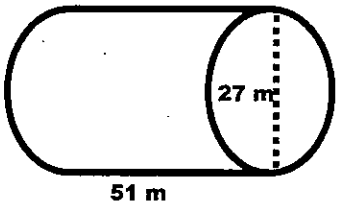
3)



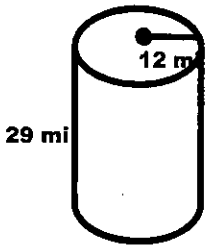
4)



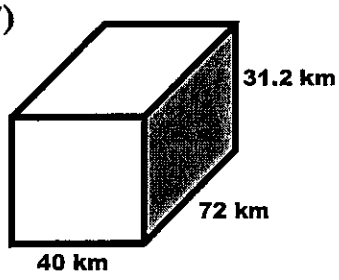
5)



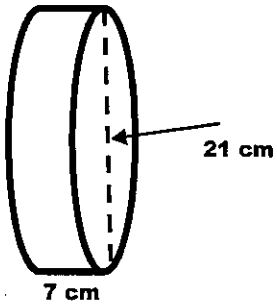
6)



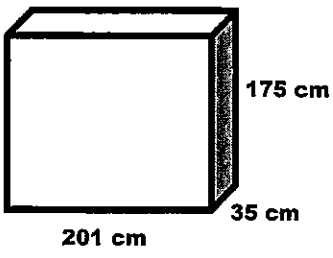
7)



8)



9)



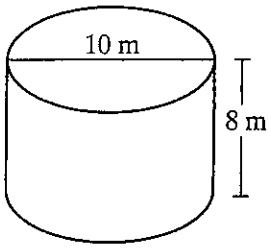
Name _____ Class _____ Date _____

Practice 10-7

Volume: Prisms and Cylinders

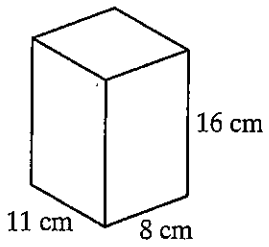
Find the volume of each prism or cylinder to the nearest cubic unit.

1.



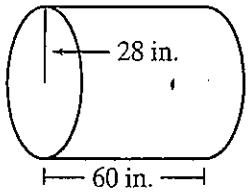
_____

2.



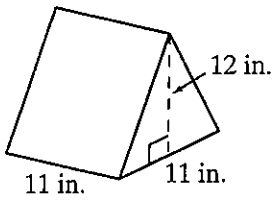
_____

3.



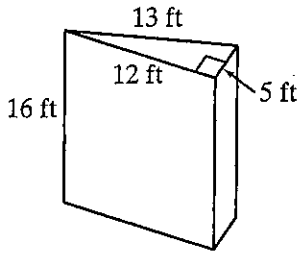
_____

4.



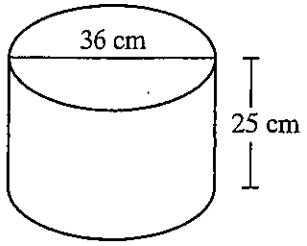
_____

5.



_____

6.



_____

7. prism
rectangular base:
8 in. by 6 in.
height: 7 in.

_____

8. cylinder
radius: 14 in.
height: 18 in.

_____

9. cylinder
radius: 5 cm
height: 11.2 cm

_____

10. prism
square base:
3.5 ft on a side
height: 6 ft

_____

11. cube
sides: 13 m

_____

12. cylinder
diameter: 5 ft
height: 9 ft

_____

13. A water storage tank has a cylindrical shape. The base has a diameter of 18 m and the tank is 32 m high. How much water, to the nearest cubic unit, can the tank hold?

_____

14. A tent in the shape of a triangular prism has a square base with a side of 8 feet and a height of 6 feet. What is the volume of the tent?

_____

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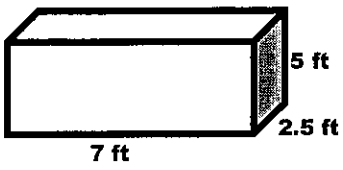
Chapter 10 Test Review Worksheet

Name _____
Period _____

Find the surface area AND volume of each figure.

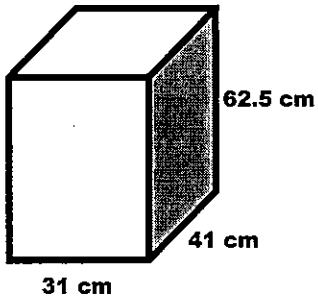
1)



Surface Area: _____

Volume: _____

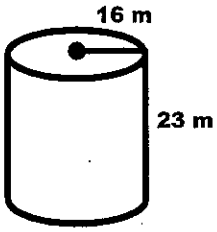
2)



Surface Area: _____

Volume: _____

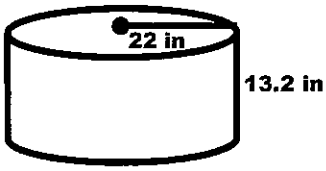
3)



Surface Area: _____

Volume: _____

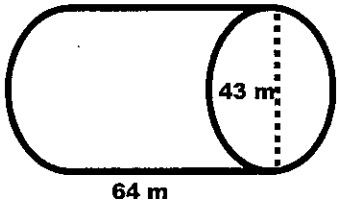
4)



Surface Area: _____

Volume: _____

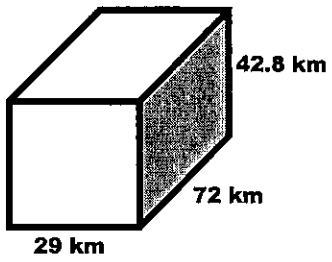
5)



Surface Area: _____

Volume: _____

6)

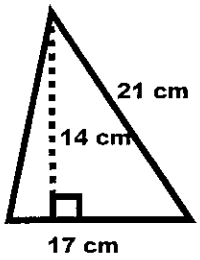


Surface Area: _____

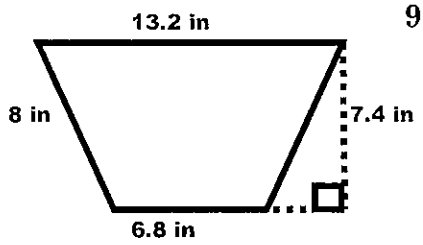
Volume: _____

Find the area of each figure.

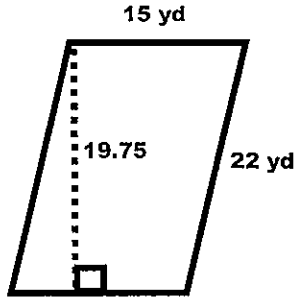
7)



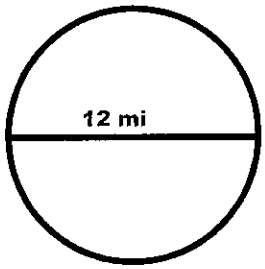
8)



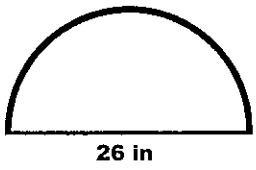
9)



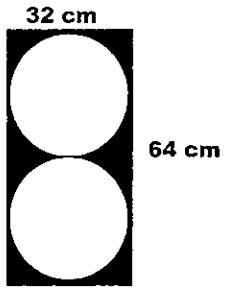
10)



11)



12)



13) A dog is tied to a stake with a 30 ft chain. How much area does the dog have to move around?

14) A can is 5 in wide and 11 in high. Find the surface area AND volume of the can.