# Math 7Adv

Colonial School District

Summer Math Packet

The concepts included in this packet will help reinforce key skills your child has encountered in math this year. Please encourage them to complete as many activities as possible as it will lead to greater success next year. The answer key to this packet is available on the district website (www.colonialsd.org).

June 2019
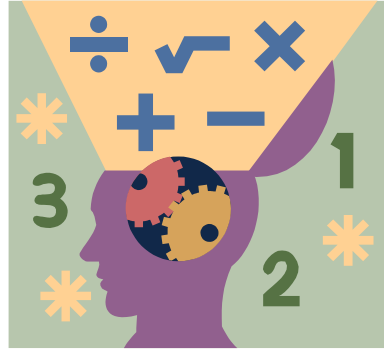
Dear Parents/Guardians,

First, we would like to thank you for all of the additional support you offer at home. Education is a true partnership between school and family that is essential to a child's success.

As this school year comes to a close, we wanted to again encourage you to continue to reinforce and foster the mathematical skills and practices that have been developed this year by scheduling time for your child to work through this summer math packet. The activities were selected by our grade level experts with the key mathematical concepts of the school year in mind. The ultimate goal is to reinforce and strengthen the skills that will serve as building blocks for future learning.

Wishing you a relaxing, yet exciting, math-filled summer!

Sincerely,

The Curriculum Department

Fractions: Solving Equations

Name _____

Solve and check each equation.

$$n - \frac{6}{8} = \frac{2}{3}$$

$$n - \frac{6}{8} + \frac{6}{8} = \frac{2}{3} + \frac{6}{8}$$

$$n = 1\frac{5}{12}$$

$$1\frac{5}{12} - \frac{6}{8} = \frac{2}{3}$$

$$\frac{17}{12} - \frac{6}{8} = \frac{2}{3}$$

$$\frac{34}{24} - \frac{18}{24} = \frac{16}{24} = \frac{2}{3} \checkmark$$

1. Look at what has been done to the variable.

2. Undo it by using the inverse (opposite) operation on both sides of the equation.

3. Check your answer by plugging it back into the equation to see if it makes the equation true.

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1. $x - \frac{2}{3} = \frac{4}{9}$

2. $x + \frac{3}{4} = \frac{8}{9}$

3. $m - \frac{3}{10} = \frac{5}{8}$

4. $\frac{4}{5}y = 5$

5. $6x = \frac{4}{3}$

6. $c + \frac{3}{4} = \frac{4}{5}$

7. $y - \frac{10}{30} = \frac{2}{5}$

8. $x + \frac{1}{2} = \frac{7}{10}$

9. $1\frac{2}{3}x = \frac{6}{5}$

10. $1\frac{2}{9} = 18h$

11. $\frac{x}{12} = 2\frac{3}{10}$

12. $\frac{3}{7} = x + \frac{2}{5}$

13. $\frac{1}{5} + y = \frac{1}{4}$

14. $\frac{5}{6}x = \frac{7}{12}$

15. $6n = \frac{3}{5}$

Equations

Two-step Equations

RULE	EXAMPLE
1. First, undo addition or subtraction. 2. Then, undo multiplication or division. 3. Check your answer by replacing the variable with the solution.	$3x - 2 = 13$ $\underline{+2 \quad +2}$ $\dfrac{3x}{3} = \dfrac{15}{3}$ $x = 5$ $\checkmark \; 3 \times 5 - 2$ $15 - 2 = 13$

Solve.

1. $6d - 3 = 32$

2. $\dfrac{x}{5} + 2 = 6$

3. $2y + 7 = 15$

4. $\dfrac{b}{7} - 13 = 23$

5. $-5y + 9 = 24$

6. $\dfrac{\ell}{8} - 3 = -27$

Equations

Equations with Variables on Both Sides

RULE	EXAMPLE
1. Eliminate the variable from one side of the equation using inverse operations. 2. Undo addition or subtraction. 3. Then, undo multiplication or division. 4. Check your answer by replacing the variable with the solution.	$8x - 3 = 6x + 1$ $\underline{-6x \qquad -6x}$ $2x - 3 = \qquad 1$ $\underline{+ 3 \qquad\quad + 3}$ $\dfrac{2x}{2} = \dfrac{4}{2}$ $x = 2$ ✓ $8 \times 2 - 3 = 6 \times 2 + 1$ $16 - 3 = \quad 12 + 1$ $13 = \qquad 13$

Solve.

1. $3k + 10 = 2k - 21$

2. $x - 4 = 6x - 19$

3. $18 + 4p = 6p + 11$

4. $11h - 14 = 7 + 14h$

5. $-3p + 8 = 2p - 2$

6. $-t + 10 = t + 4$

Finding Slope from Tables
Homework

Name_____

Date_____ Period_____

Determine the slope of the line represented by the table of values. Describe the graphs of the line as increasing, decreasing, horizontal, or vertical. Copy one of these tables on the back of this page and write a situation that describes the data.

1.

x	y
-2	3
-1	5
0	7
1	9
2	11

m =

Graph Description

2.

x	y
-3	5
-2	2
-1	-1
0	-4
1	-7

m =

Graph Description

3.

x	y
1	-17
2	-13
3	-9
4	-5
5	-1

m =

Graph Description

4.

x	y
-6	-4
-5	-9
-4	-14
-3	-19
-2	-24

m =

Graph Description

5.

x	y
0	3
1	5.5
2	8
3	10.5
4	13

m =

Graph Description

6.

x	y
-2	5
-1	4.75
0	4.5
1	4.25
2	4

m =

Graph Description

7.

x	y
-2	$\frac{2}{5}$
-1	$\frac{4}{5}$
0	$\frac{6}{5}$
1	$\frac{8}{5}$

m =

Graph Description

8.

x	y
-1	1
1	2
3	3
5	4
7	5

m =

Graph Description

9.

x	y
-5	10
-2	5
1	0
4	-5
7	-10

m =

Graph Description

10.

x	y
-5	10
-3	6
-1	2
1	-2
3	-6

m =

Graph Description

11.

x	y
-4	6
-2	6
0	6
2	6
4	6

m =

Graph Description

12.

x	y
5	2
5	4
5	6
5	8
5	10

m =

Graph Description

Examples:

a) Find a slope-intercept equation for the line with slope 2 that contains $(0,5)$.

$y = mx + b$ 　　　　　　　The slope-intercept equation.

$y = 2x + 5$ 　　　　　　　Substitute 2 for m and 5 for b.

b) Find an equation of a line that contains the points $(5,-2)$ and $(-2,1)$.

$m = \dfrac{1-(-2)}{-2-5} = \dfrac{3}{-7} = -\dfrac{3}{7}$ 　　　First find the slope.

$y = -\dfrac{3}{7}x + b$ 　　　　　　Using the slope-intercept form $y = mx + b$ and substituting for m.

$1 = -\dfrac{3}{7}(-2) + b$ 　　　　　Using the point $(-2,1)$ and substituting $x = -2$ and $y = 1$.

　　　　　　　　　　　　　(We could have just as easily used the point $(5,-2)$).

$1 = \dfrac{6}{7} + b$

$\dfrac{1}{7} = b$

$y = -\dfrac{3}{7}x + \dfrac{1}{7}$ 　　　　　Substitute b into $y = mx + b$.

Find an equation of the line containing the given point and having the given slope.

1. $(4,-3)$, $m = -1$ _____ 　　2. $(-5,-6)$, $m = 2$ _____

3. $(-7,2)$, $m = 3$ _____ 　　4. $(3,5)$, $m = -2$ _____

5. $(6,-2)$, $m = -3$ _____ 　　6. $(5,-2)$, $m = 2$ _____

7. $(7,0)$, $m = 4$ _____ 　　8. $(0,9)$, $m = -2$ _____

9. $(5,-1)$, $m = \dfrac{1}{5}$ _____ 　　10. $(-3,-2)$, $m = \dfrac{1}{4}$ _____

Find an equation of the line that contains the given pair of points

11. $(1,5)$ and $(4,2)$ _____

12. $(-4,2)$ and $(1,-3)$ _____

13. $(-5,-3)$ and $(1,-1)$ _____

14. $(0,3)$ and $(-2,6)$ _____

15. $(-8,3)$ and $(-4,1)$ _____

16. $(6,2)$ and $(-3,0)$ _____

17. $(1,3)$ and $(4,6)$ _____

18. $(3,-4)$ and $(-3,4)$ _____

19. $(-7,4)$ and $(-4,7)$ _____

20. $(9,-5)$ and $(7,7)$ _____

What Did the Ape Think of the Grape's House?

For each exercise, draw the line indicated and write its equation. Find your answer in the answer section and notice the two letters next to it. Print these letters in the two boxes at the bottom of the page that contain the number of that exercise.
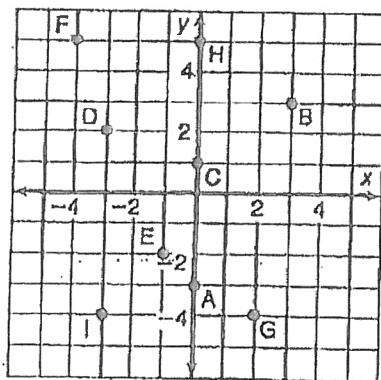
1. Equation of $\overleftrightarrow{AB}$ _____

2. Equation of $\overleftrightarrow{CB}$ _____

3. Equation of $\overleftrightarrow{DE}$ _____

4. Equation of $\overleftrightarrow{FG}$ _____

5. Equation of $\overleftrightarrow{HI}$ _____
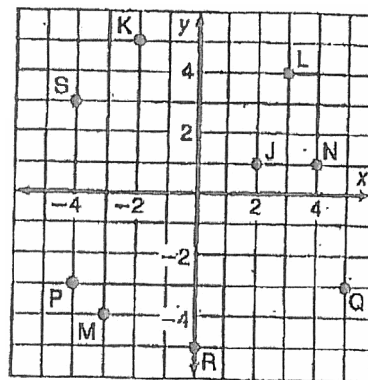
6. Equation of $\overleftrightarrow{JK}$ _____

7. Equation of $\overleftrightarrow{LM}$ _____

8. Equation of $\overleftrightarrow{NS}$ _____

9. Equation of $\overleftrightarrow{PQ}$ _____

10. Equation of $\overleftrightarrow{RQ}$ _____

Answers:

DE $\quad y = -\frac{1}{4}x + 2$

SA $\quad y = \frac{4}{3}x - 1$

TH $\quad y = -\frac{3}{2}x + 2$

AS $\quad y = 2x - 3$

HE $\quad y = 3x + 5$

TT $\quad y = \frac{2}{5}x$

NE $\quad y = \frac{2}{3}x + 1$

OU $\quad y = -x + 3$

GH $\quad y = -\frac{3}{2}x - 1$

TW $\quad y = -3$

EA $\quad y = -2x + 3$

VI $\quad y = \frac{2}{5}x - 5$

TH $\quad y = -2x - 4$

TI $\quad y = \frac{4}{3}x$

SH $\quad y = \frac{2}{3}x + 5$

5	5	3	3	6	6	4	4	7	7	9	9	1	1	8	8	10	10	2	2

OBJECTIVE 5-I: To find an equation of a line given two points on the line (using the graph).

Name_____

Anchor Activity - Writing Linear Equations

Period____

Write the slope-intercept form of the equation of each line.

1)
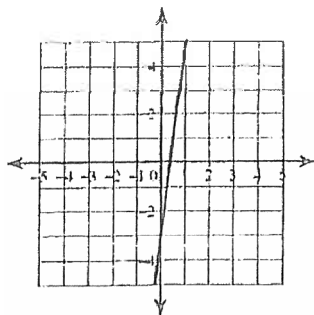
2)
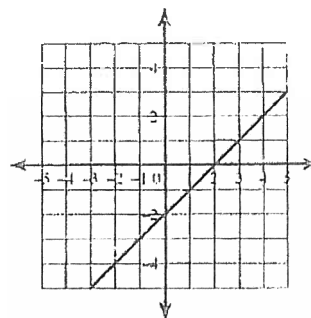
3)
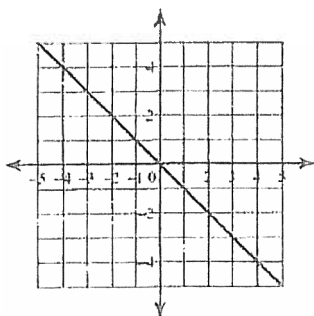
4)
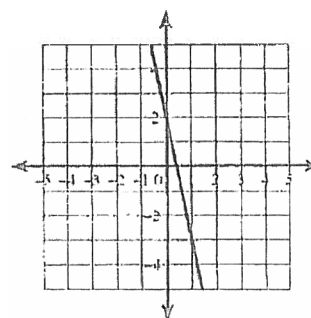
Write the slope-intercept form of the equation of each line given the slope and y-intercept.

5) Slope = –4, y-intercept = –2

6) Slope = $\frac{4}{3}$, y-intercept = –3

Write the slope-intercept form of the equation of the line through the given points.

7) through: $(2, 4)$ and $(3, 3)$

8) through: $(3, 1)$ and $(-2, 4)$

9) through: $(2, -2)$ and $(-5, 5)$

10) through: $(3, -4)$ and $(-5, 2)$

Name _____

Graphing Lines
Change to Slope-intercept form then
Sketch the graph of each line.

Date _____ Period ____

1) $7x + y = 5$
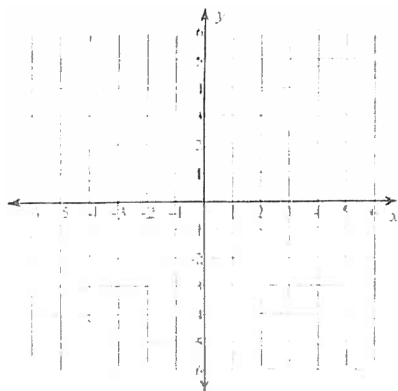
2) $3x + 5y = -5$
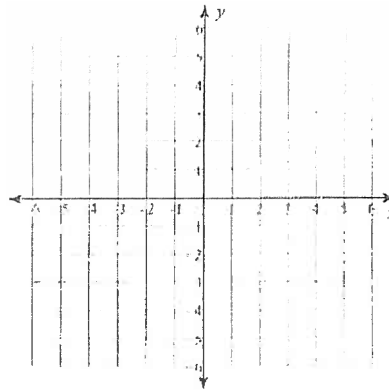
3) $y = 4$
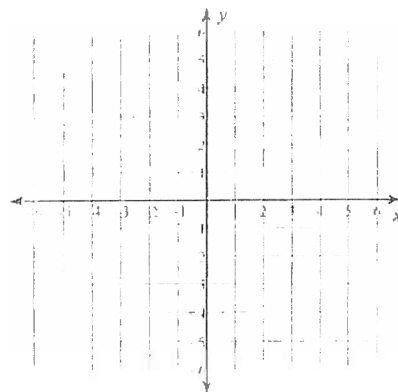
4) $6x + 5y = 20$
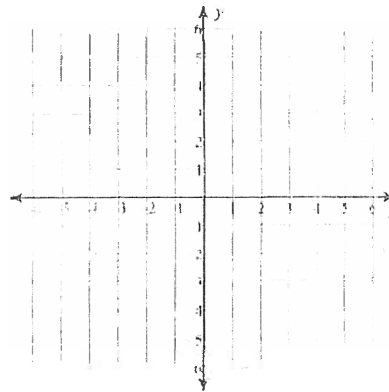
5) $x = -3$
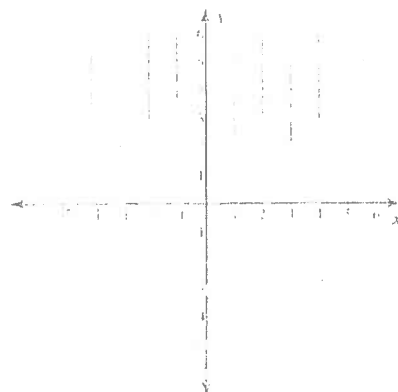
6) $2x + y = 4$
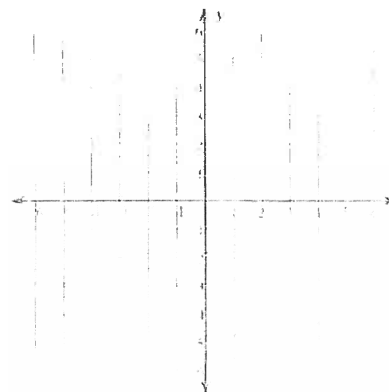
7) $x + y = 3$
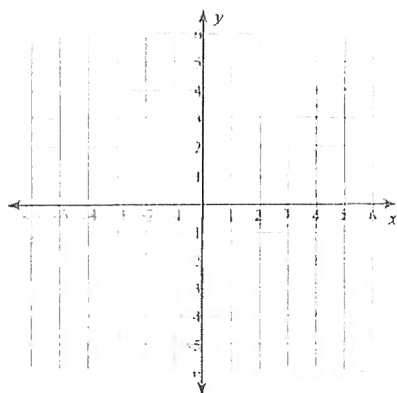
8) $10x - 3y = 15$
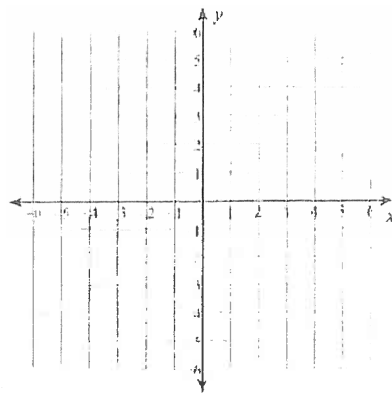
9) $x - y = 3$

10) $y = 0$

11) $x + y = -3$

12) $x + y = -1$

Name_____
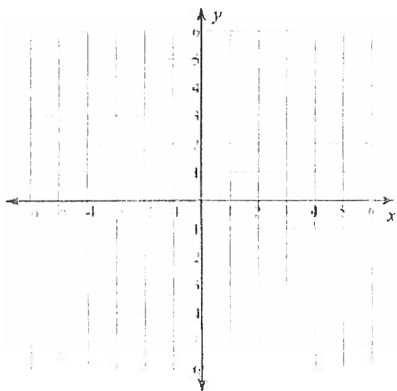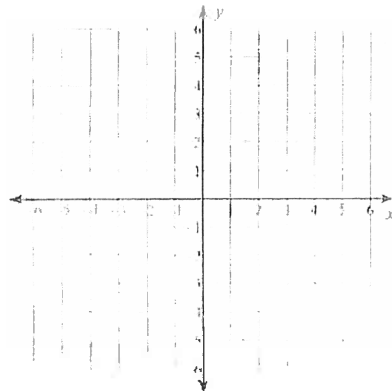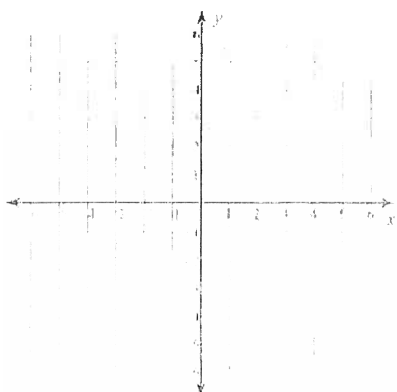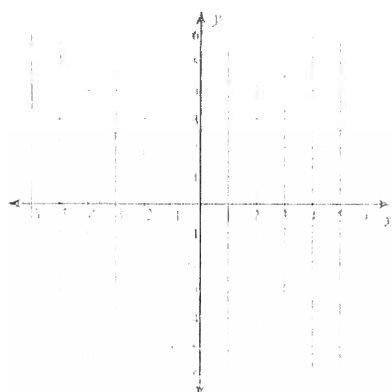
Writing Linear Equations

Date_____ Period____

Write the slope-intercept form of the equation of each line.

1) $3x - 2y = -16$

2) $13x - 11y = -12$

3) $9x - 7y = -7$

4) $x - 3y = 6$

5) $6x + 5y = -15$

6) $4x - y = 1$

7) $11x - 4y = 32$

8) $11x - 8y = -48$

slope

Write the ~~intercept~~ **form of the equation of the line through the given point with the given slope.**

9) through: $(1, 2)$, slope = 7

10) through: $(3, -1)$, slope = -1

11) through: $(-2, 5)$, slope = -4

12) through: $(3, 5)$, slope = $\dfrac{5}{3}$

Infinite Algebra 1   Name _____

Multi-Step Inequalities   Date _____ Period _____

Solve each inequality and graph its solution.

1) $3 < -5n + 2n$
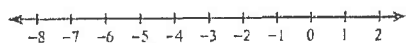
2) $6x + 2 + 6x < 14$
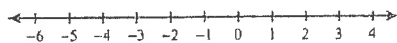
3) $-p - 4p > -10$
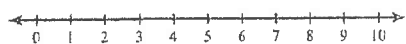
4) $18 \geq 5k + 4k$
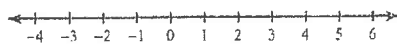
5) $9 \geq -2m + 2 - 3$
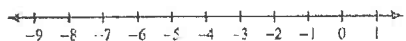
6) $-3 - 6(4x + 6) > -111$
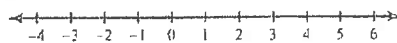
7) $6 - 4(6n + 7) \geq 122$
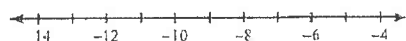
8) $-138 \geq -6(6b - 7)$
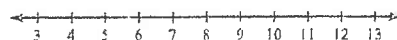
9) $167 < 6 + 7(2 - 7r)$
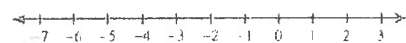
10) $5(6 + 3r) + 7 \geq 127$
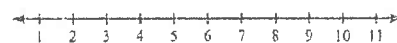
11) $-8x + 2x - 16 < -5x + 7x$

12) $-1 - 6x - 6 > -11 - 7x$

1
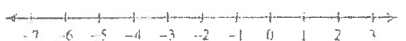
FINDING RULES FOR PATTERNS

Consider the following table of values:

x	0	1	2	3	4	5	6
y	-2	2	6	10	14	18	22

Represent the relationship of x to y by an equation.

STRATEGY: To figure out the rule, first study the y-values.

    STEP 1:   Find a pattern for the y-values:

        -2, 2, 6, 10, 14, 18, 22...

    You can see that these numbers increase by 4 from one number to the next.

    So the pattern involves multiples of 4. The equation will have $4x$ as part of it.

    STEP 2:   Find each value for $4x$. Multiply each x-number by 4.

    Substitute these "$4x$-numbers" for the x-numbers of Step 2 and the corresponding y-numbers.

4x	0	4	8	12	16	20	24
y	-2	2	6	10	14	18	22

    Notice that each y-value is 2 less than the corresponding $4x$-number.

    Translated into an equation this statement becomes:

SOLUTION: $y = 4x - 2$

1. Consider the following table of values:

x	0	1	2	3	4	5	6
y	1	6	11	16	21	26	31

Which equation represents the relationship of x to y?

a. $y = 6x + 1$
b. $y = 5x + 1$
c. $y = 5x - 1$
d. $y = x + 5$

2. Consider the following table of values:

x	0	1	2	3	4	5	6
y	2	6	10	14	18	22	26

Which equation represents the relationship of x to y?

a. $y = 4x + 2$
b. $y = 4x - 2$
c. $y = 3x + 4$
d. $y = 2x + 6$

3. What rule applies to the following data?

x	0	1	2	3	4
y	-3	-2	-1	0	1

a. $y = x - 3$
b. $y = x + 3$
c. $y = 2x - 5$
d. $y = x^2 - 3$

4. Which rule applies to the following table?

x	5	3	1	-1	-3
y	13	7	1	-5	-11

a. $y = 6x - 1$
b. $y = 6x + 1$
c. $y = 3x - 2$
d. $y = 2x + 3$

Exterior Angles

Find the value of x.

1)

$x = $ _____

2)

$x = $ _____

3)

$x = $ _____

4)

$x = $ _____

5)

$x = $ _____

6)

$x = $ _____

7)

$x = $ _____

8)

$x = $ _____
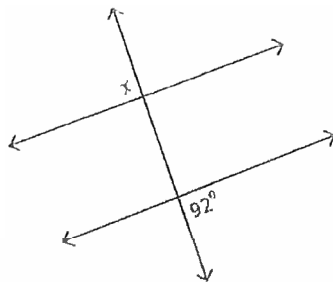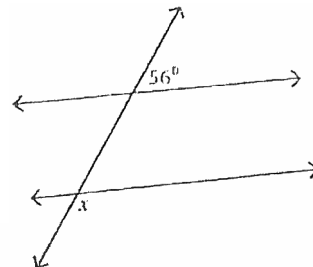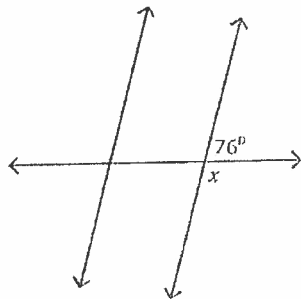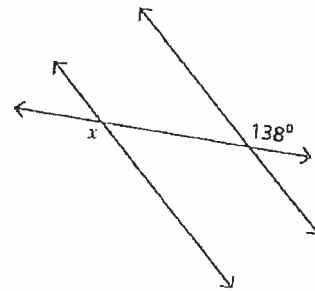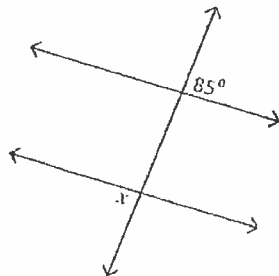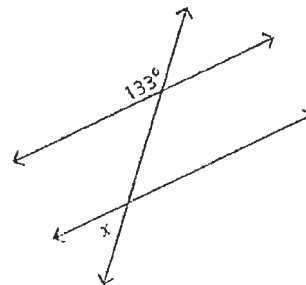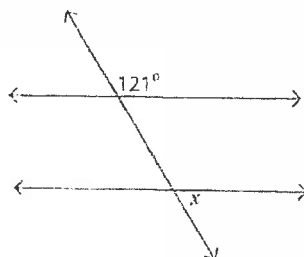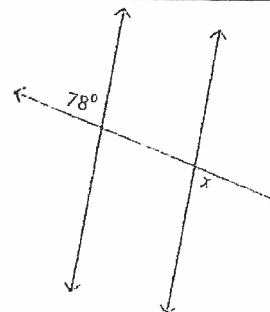
Alternate & Same Side Angles

Find the value of x.

1)

$(5x+12)^\circ$

$7x^\circ$

$x =$ _____

2)

$(x+9)^\circ$

$(2x-41)^\circ$

$x =$ _____

3)

$(2x-26)^\circ$

$(x+11)^\circ$

$x =$ _____

4)

$(2x+10)^\circ$

$(x+25)^\circ$

$x =$ _____

5)

$(4x+3)^\circ$

$(7x+1)^\circ$

$x =$ _____

6)

$(3x+25)^\circ$

$(4x-5)^\circ$

$x =$ _____

7)

$(2x+2)^\circ$

$(x+53)^\circ$

$x =$ _____

8)

$(6x-10)^\circ$

$(7x-10)^\circ$
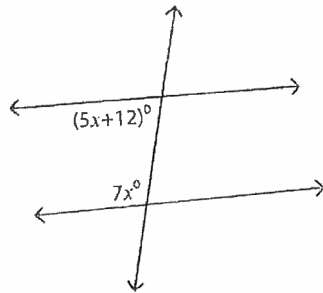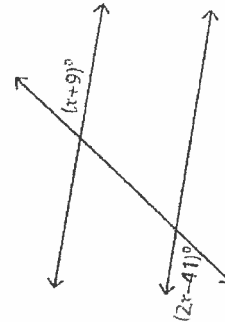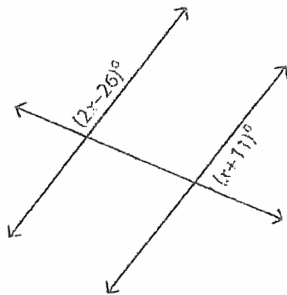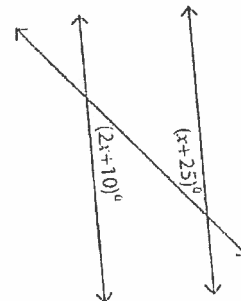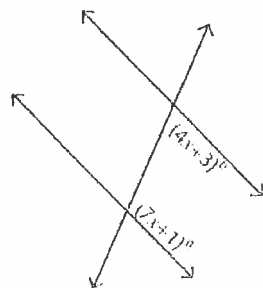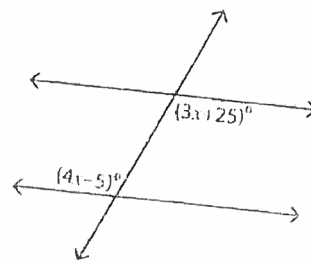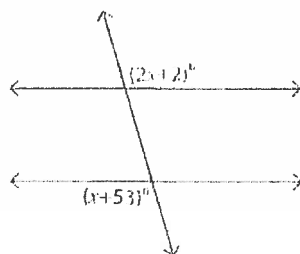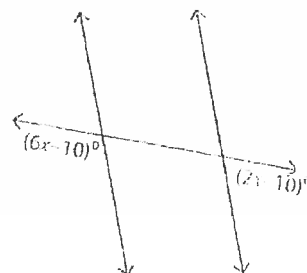
$x =$ _____

Name: _____

Per #

Math 7H

Independent Events Worksheet

1. The spinner at the right is spun once and a card is drawn from a deck of 4 cards labeled A, B, C, and D. Find the following probabilities:

a) P(3 and A) _____   e) P(5 and C) _____

b) P(4 and B or C) _____

c) P(not 4 and C) _____

d) P(1 and not D) _____
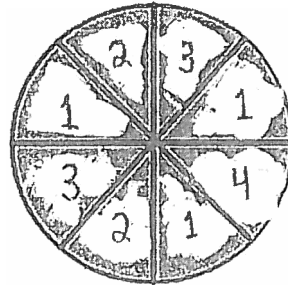
2. Each of the spinners at the right is spun once. Find the probability:

a) P(M and an odd #) _____

b) P(a vowel and a # < 3) _____

c) P(not H and a prime #) _____

d) P(a letter and a #) _____
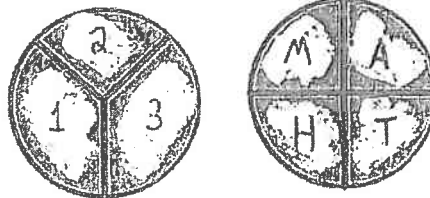
3. One deck of cards is numbered 1-12 and a second deck of cards is numbered 1-9. A card is drawn from the 12 card deck , then from the 9 card deck. Find the probability:

a) P(4 and 4) _____   d) P(not 5 or 8 and an even #) _____

b) P(an even # and an odd #) _____   e) P(not 11 and a factor of 9) _____

c) P(a factor of 10 and a   f) P(a composite # and a prime #) _____
multiple of 3)

THE PYTHAGOREAN THEOREM

One of the most famous theorems in the history of mathematics is the **Pythagorean Theorem**. It has to do with the sides of right triangles:

The Pythagorean Theorem
In any right triangle, the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs.

As a formula, the Pythagorean Theorem is:

$$a^2 + b^2 = c^2$$

You will often use this formula to solve problems.
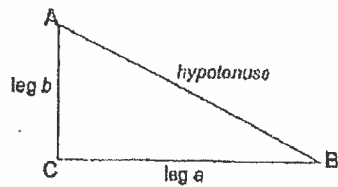
1. What is x?
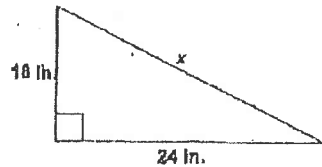
    a. 12 in.
    b. 30 in.
    c. 36 in.
    d. 40 in.

2. What is x?
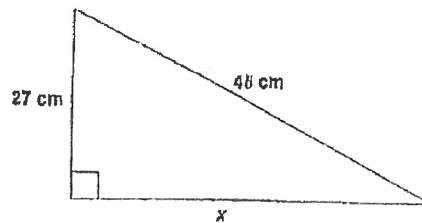
    a. 20 cm
    b. 25 cm
    c. 28 cm
    d. 36 cm

3. The length and width of a rectangle are 12 m and 5 m. What is the length of the diagonal? Show your work.

Pythagorean Theorem word problems ws #1

Solve each of the following. Please draw a picture and use the Pythagorean Theorem to solve. Be sure to label all answers and leave answers in exact simplified form.

1. The bottom of a ladder must be placed 3 feet from a wall. The ladder is 12 feet long. How far above the ground does the ladder touch the wall?

2. A soccer field is a rectangle 90 meters wide and 120 meters long. The coach asks players to run from one corner to the corner diagonally across the field. How far do the players run?

3. How far from the base of the house do you need to place a 15' ladder so that it exactly reaches the top of a 12' wall?

4. What is the length of the diagonal of a 10 cm by 15 cm rectangle?

5. The diagonal of a rectangle is 25 in. The width is 15 in. What is the area of the rectangle?

6. Two sides of a right triangle are 8" and 12"..
   A. Find the the area of the triangle if 8 and 12 are legs.

   B. Find the area of the triangle if 8 and 12 are a leg and hypotenuse.

7. The area of a square is 81 cm^2. Find the perimeter of the square.

8. An isosceles triangle has congruent sides of 20 cm. The base is 10 cm. What is the area of the triangle?
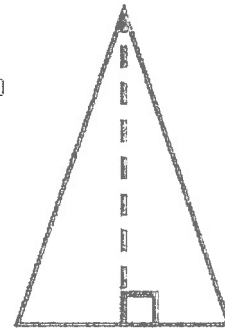
9. A baseball diamond is a square that is 90' on each side. If a player throws the ball from 2nd base to home, how far will the ball travel?

10. Jil's front door is 42" wide and 84" tall. She purchased a circular table that is 96 inches in diameter. Will the table fit through the front door?

Formula Sheet

Circle
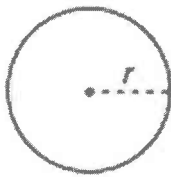
$C = 2\pi r$ $A = \pi r^2$

Triangle
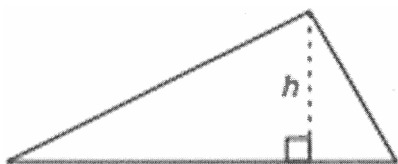
$A = \dfrac{1}{2}bh$

Square

$A = s^2$

Rectangle
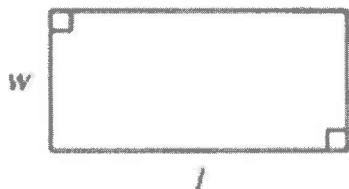
$A = lw$ $P = 2l + 2w$

Parallelogram
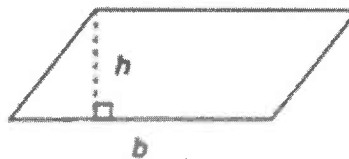
$A = bh$

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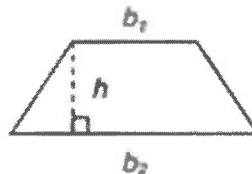
$A = \dfrac{1}{2}h(b_1 + b_2)$

Rectangular Prism
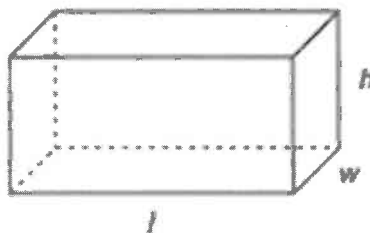
$V = lwh$ $SA = 2lw + 2lh + 2wh$

Polygonal Prism
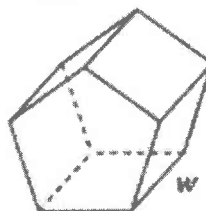
$V = Bw$, where B = area of the base
$SA = Pw + 2B$, where P = perimeter of base

Cone
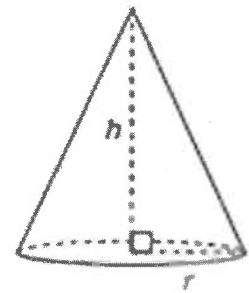
$V = \dfrac{1}{3}\pi r^2 h$

Cylinder

$V = \pi r^2 h$

Sphere

$V = \dfrac{4}{3}\pi r^3$

Name _____ Date _____ Class _____
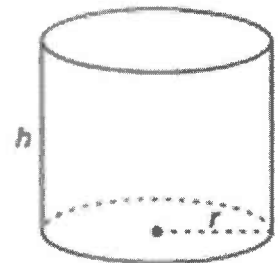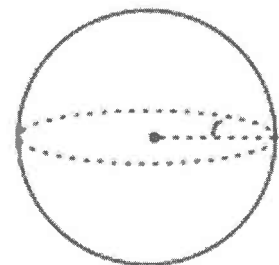
Skill: Area Review

Filling and Wrapping

Find the area of each figure.

1.   4 m
   [square, 4 m × 4 m]

2.   23 cm, 5 cm

3.   5 in., 4 in., 8 in.

4.   8 mm, 10 mm, 10 mm

5.   21 cm, 32 cm, 13 cm, 46 cm

6.   9.4 mi, 15.7 mi, 12.6 mi

7.   12.9 km, 8.0 km, 8.7 km, 6.7 km, 3.4 km

8.   50 yd, 97 yd, 54 yd, 53 yd

9.   18 ft, 9 ft, 11 ft, 12 ft

10.   16.4 mm, 10.6 mm, 9.7 mm, 10.6 mm, 24.8 mm
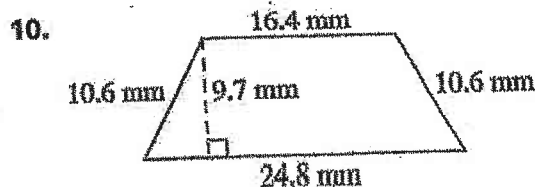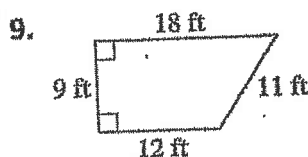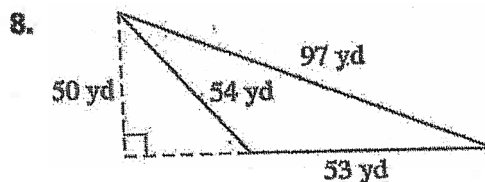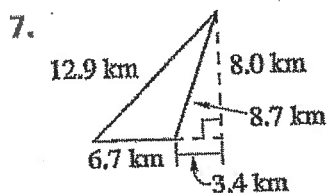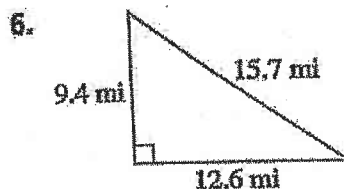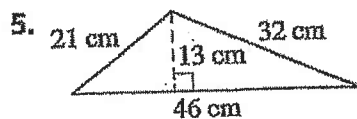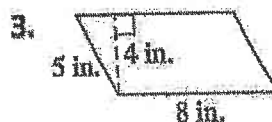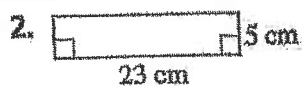
Name : _____   Score : _____

Easy: S1

Area & Circumference

Find the   area and circumference of each circle.

1)

8 ft
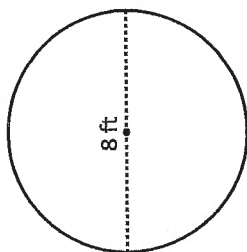
Radius = _____
Diameter = _____
Area = _____
Circumference = _____

2)

7 cm
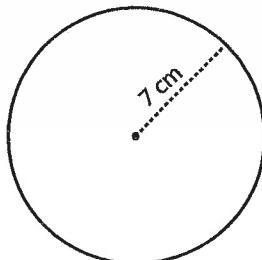
Radius = _____
Diameter = _____
Area = _____
Circumference = _____

3)

18 m
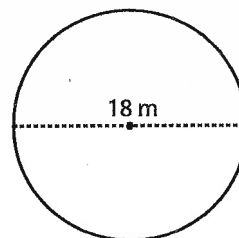
Radius = _____
Diameter = _____
Area = _____
Circumference = _____

4)
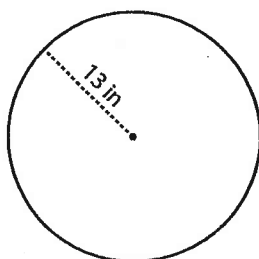
13 in

Radius = _____
Diameter = _____
Area = _____
Circumference = _____

5)
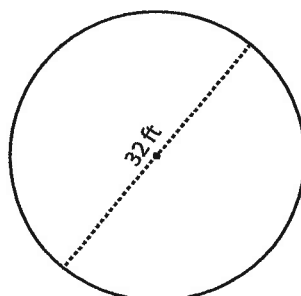
32 ft

Radius = _____
Diameter = _____
Area = _____
Circumference = _____

6)
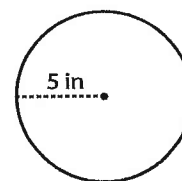
5 in

Radius = _____
Diameter = _____
Area = _____
Circumference = _____

7)
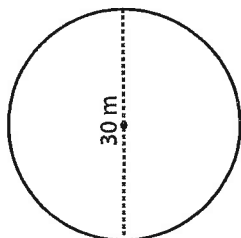
30 m

Radius = _____
Diameter = _____
Area = _____
Circumference = _____

8)
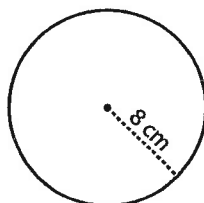
8 cm

Radius = _____
Diameter = _____
Area = _____
Circumference = _____

9)

20 ft

Radius = _____
Diameter = _____
Area = _____
Circumference = _____

Printable Math Worksheets @ www.mathworksheets4kids.com
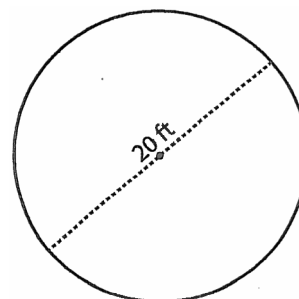
Skill: Area Review (continued)

Find the area of each figure.

11.

12 in.

15 in.   17 in.

20 in.

12.

21.5 mi

7 mi

12 mi   9 mi

6 mi

13.

8 m

8 m   10 m

14 m

14.

18 in.

12 in.

17 in.

6 in.

Find the ~~perimeter~~ and area of each figure. *circumference*

15.

3 in.

16.

2 m

17.

7 ft

18.

6 km

19.

8 mi

20.

15 in.

57
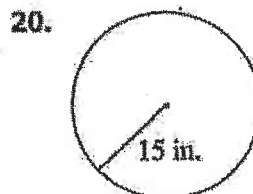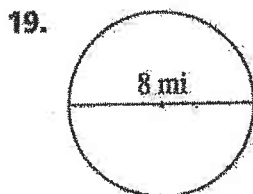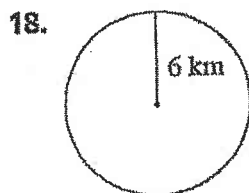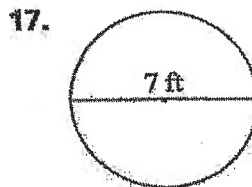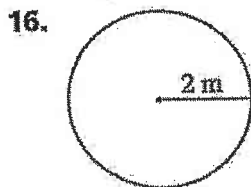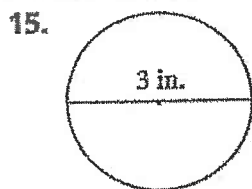
Using Angle Relationships

Find the values of the variables.

a = _____   b = _____   c = _____

d = _____   e = _____   f = _____

g = _____   h = _____   j = _____   k = _____

57° a°

120°

(b + 44)°

3c°

35°

d°

2e° 88°

(f − 15)°

83° k°

35°   (h + 23)°

26°

2j° (3g + 70)°
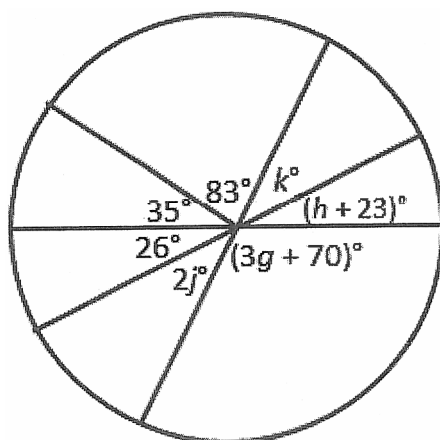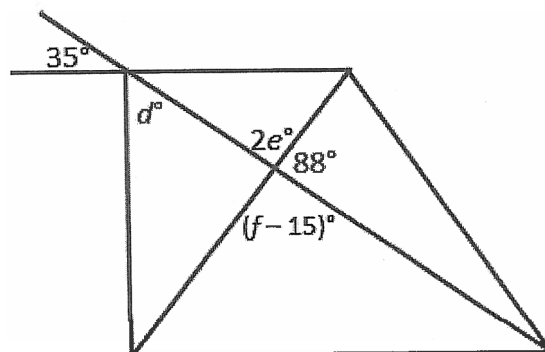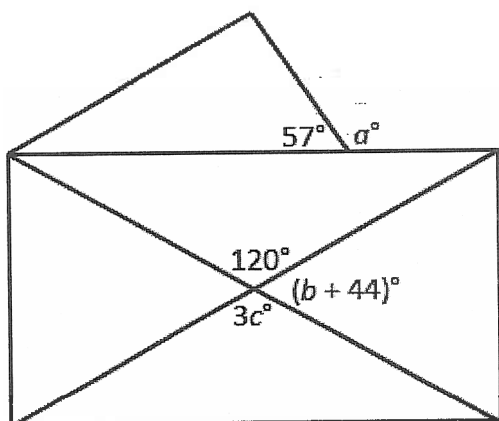
Volume - Rectangular Prism

Find the volume of each rectangular prism.

1)

8 ft, 6 ft, 3 ft

Volume = _____

2)

5 cm, 10 cm, 2 cm

Volume = _____

3)

15 in, 7 in, 4 in

Volume = _____

4)

18 m, 16 m, 6 m

Volume = _____

5)

8 mm, 4 mm, 12 mm

Volume = _____

6)

6 cm, 19 cm, 5 cm

Volume = _____

7)

4 in, 14 in, 11 in

Volume = _____

8)

13 ft, 20 ft, 5 ft

Volume = _____

9)

4 mm, 11 mm, 17 mm
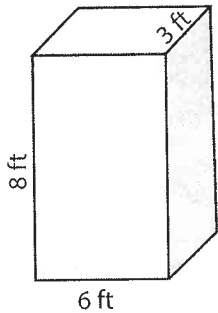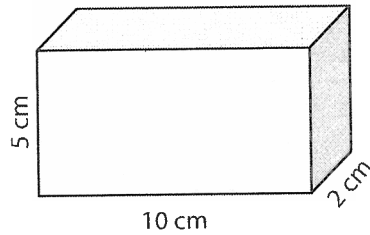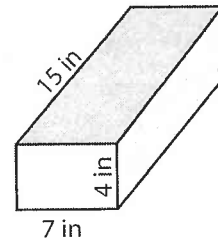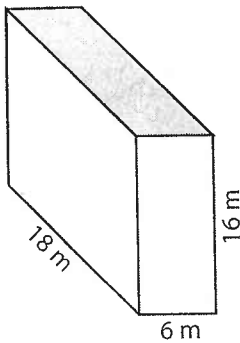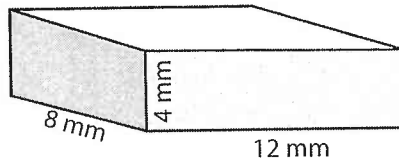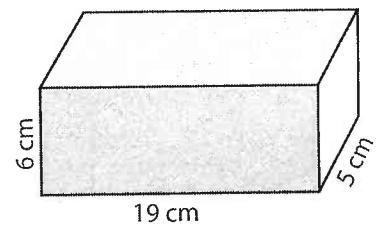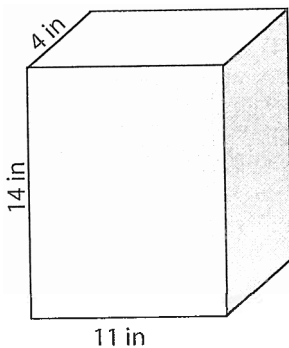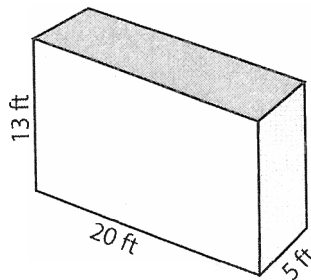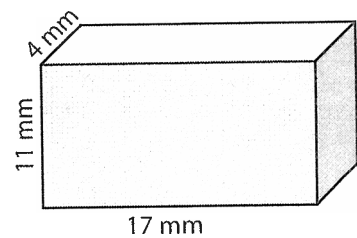
Volume = _____

10) A bath tub in the shape of a rectangular prism is 20 meter long, 10 meter wide and 5 meter deep. How much water can it hold?
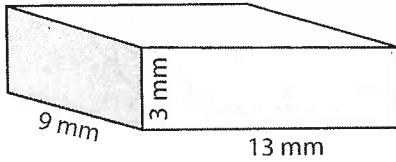
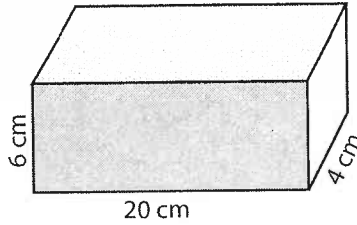Volume =

Name : _____

Surface Area - Rectangular Prism

Find the surface area of each rectangular prism.

1)

3 mm
9 mm
13 mm
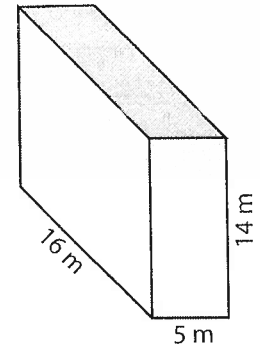
Surface Area = _____

2)

6 cm
20 cm
4 cm

Surface Area = _____

3)

16 m
14 m
5 m

Surface Area = _____

4)

14 ft
17 ft
4 ft

Surface Area = _____

5)

4 in
19 in
13 in

Surface Area = _____

6)

3 mm
9 mm
14 mm

Surface Area = _____

7)

7 cm
12 cm
2 cm

Surface Area = _____

8)

13 in
4 in
6 in
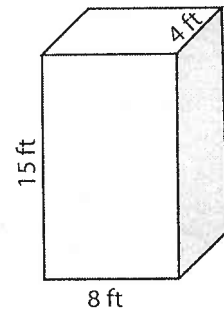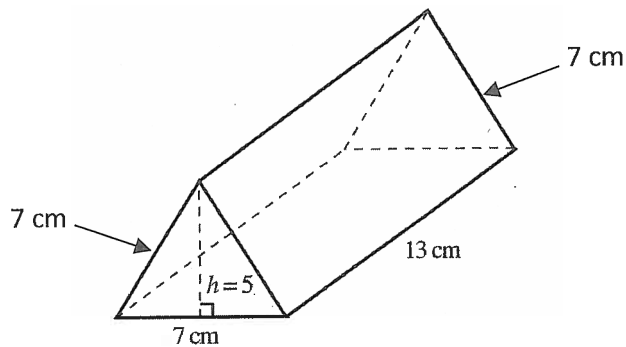
Surface Area = _____

9)

4 ft
15 ft
8 ft
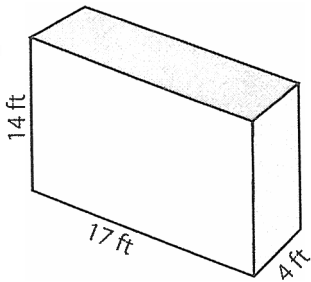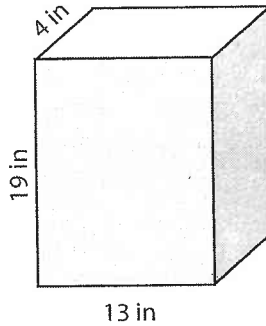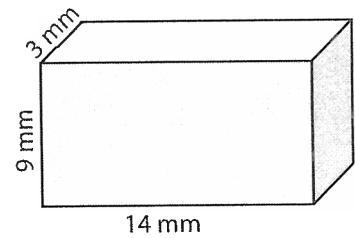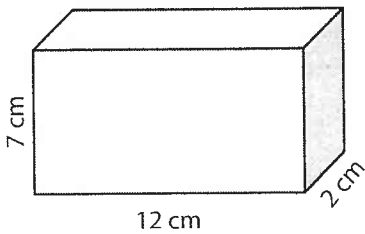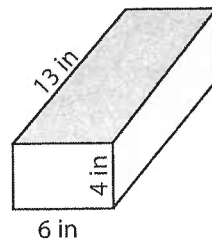
Surface Area = _____

10) A gift box in the shape of a rectangular prism has 20 centimeters length, 14 centimeters width and 10 centimeters height. How much the paper will you need to wrap the gift box?

Surface Area =

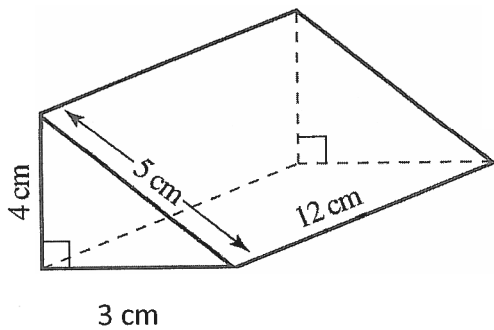# Find the Volume and Surface area of the triangular prisms below.

(B = area of the base, P = perimeter of the base, w = width, SA = surface area, V = volume)

7 cm

7 cm

$h=5$

7 cm

13 cm

$B = \frac{1}{2}bh$ SA = PW + 2B   V = BW

4 cm

5 cm

3 cm

12 cm

$B = \frac{1}{2}bh$ SA = PW + 2B   V = BW