ST. THOMAS AQUINAS CATHOLIC SCHOOL

2024 Summer Math Packet

Students Entering Geometry in August

Instructions: Please complete and return to your math teacher on the first day of school in August.

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2024 - Summer Packet - Algebra 1 → Geometry

TABLE OF CONTENTS

THE NUMBER PROPERTIES

Match each expression with the property that it shows.

$5 + 0 = 5$	Commutative Property of Addition
$5(1) = 5$	Associative Property of Addition
$5(0) = 0$	Additive Identity
$2 + 3 = 3 + 2$	Distributive Property
$2(3) = 3(2)$	Commutative Property of Multiplication
$2 + (3 + 4) = (2 + 3) + 4$	Associative Property of Multiplication
$2(3 \cdot 4) = (2 \cdot 3)4$	Zero Product Property
$3(2 + 5) = 6 + 15$	Multiplicative Identity

CALCULATING SLOPE

Find the slope between the given points or on the graph.

(1, 3) and (5, 8)

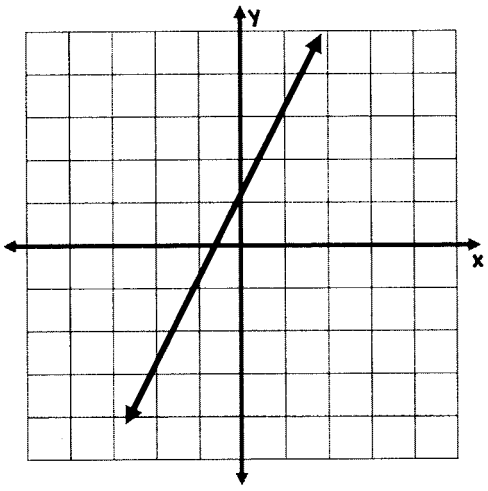
(-2, 7) and (5, 4)

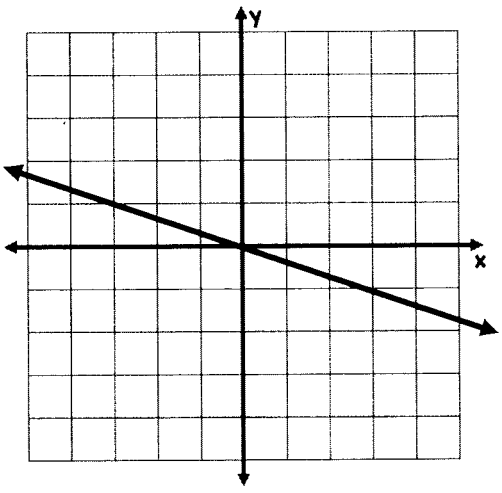
(1, -3) and (0, 8)

(-1, -9) and (4, 0)

(-8, 8) and (-2, 8)

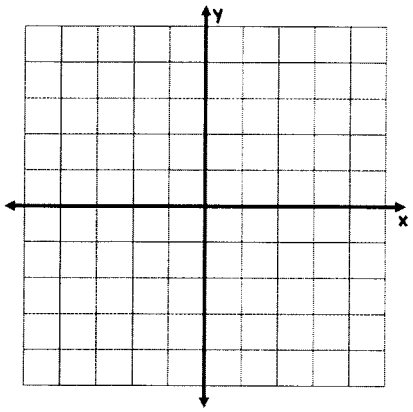
(-4, 9) and (-4, -8)



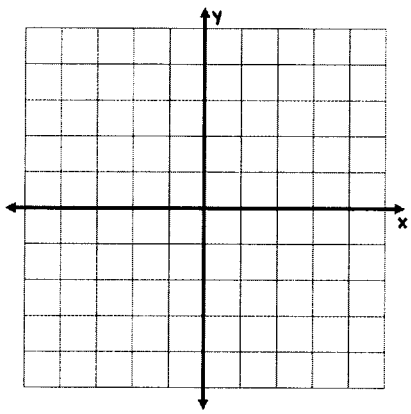


GRAPHING IN SLOPE-INTERCEPT FORM

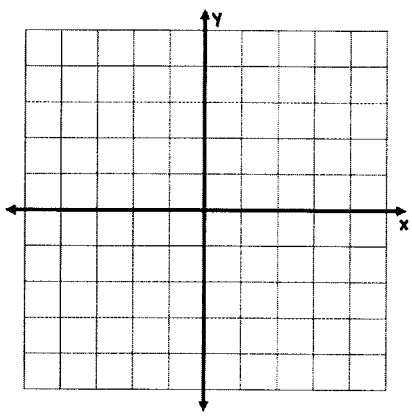
$y = x + 3$



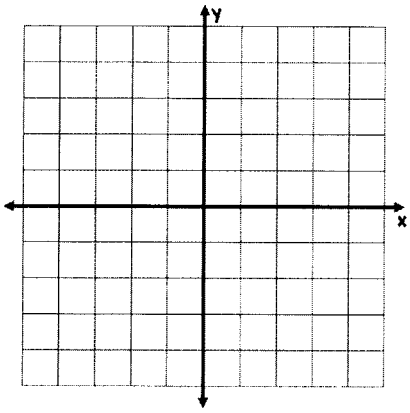
$y = x - 1$



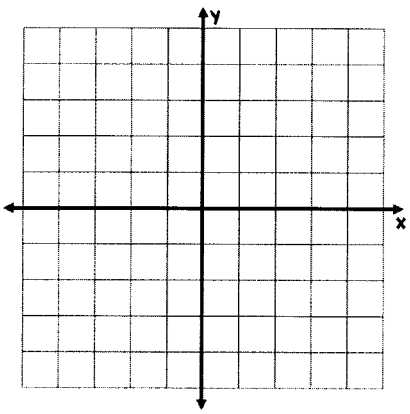
$y = 2x + 3$



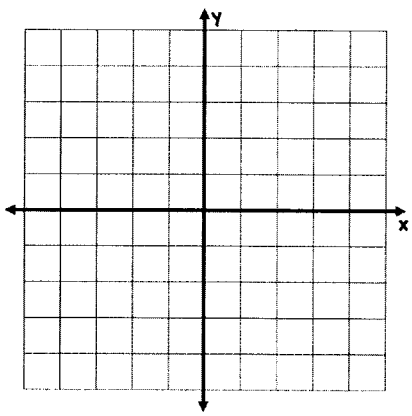
$y = -2x$



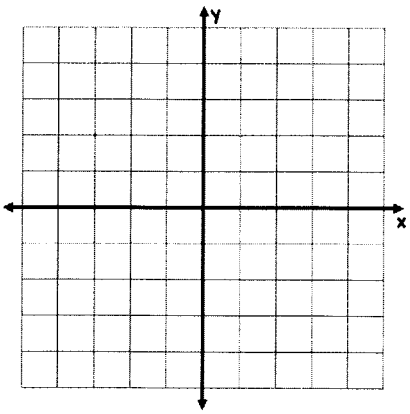
$y = -x + 3$



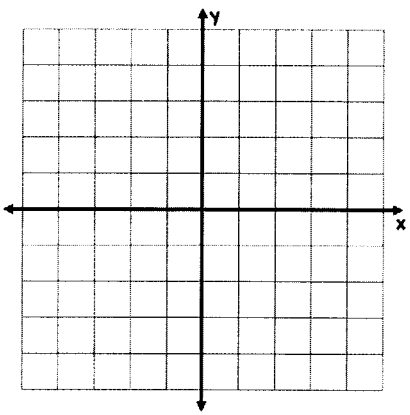
$y = -3x + 3$



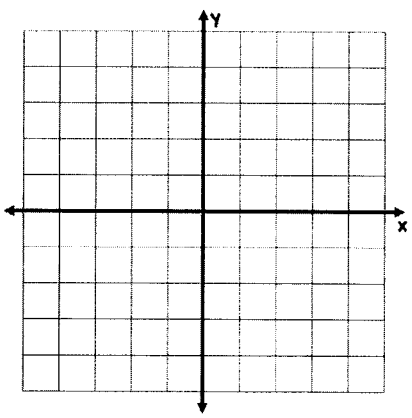
$y = \frac{1}{2}x - 4$



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



$y = \frac{4}{3}x - 3$



PARALLEL & PERPENDICULAR

Circle whether each pair of equations is parallel, perpendicular, or neither.

slope:

$$\begin{cases} y = x + 3 \\ y = x - 2 \end{cases}$$

parallel perpendicular neither

slope:

$$\begin{cases} y = 2x + 3 \\ 2x - y = 4 \end{cases}$$

parallel perpendicular neither

slope:

$$\begin{cases} y = -x \\ y = x + 4 \end{cases}$$

parallel perpendicular neither

slope:

$$\begin{cases} y = 3x + 3 \\ x - 3y = 9 \end{cases}$$

parallel perpendicular neither

slope:

$$\begin{cases} 2x + 3y = 6 \\ 3x - 2y = 4 \end{cases}$$

parallel perpendicular neither

slope:

$$\begin{cases} y = \frac{2}{5}x + 3 \\ 2x - 5y = 10 \end{cases}$$

parallel perpendicular neither

slope:

$$\begin{cases} 4x + y = 6 \\ y = -4x - 2 \end{cases}$$

parallel perpendicular neither

slope:

$$\begin{cases} y = 5x + 3 \\ x + 4y = 8 \end{cases}$$

parallel perpendicular neither

SOLVING MULTI-STEP EQUATIONS

Solve each equation. Simplify your answer.

$3(x + 4) = 2.5(x - 6)$

$2(x - 5) + 7 = -3(2x - 6)$

$\frac{1}{2}(4x - 8) = \frac{3}{4}(8x + 4)$

$\frac{1}{2}x + 5 = \frac{2}{5}x - 8$

$\frac{2}{3}(5x + 6) = \frac{3}{2}(8x - 4)$

$\frac{1}{3}x + \frac{1}{4} = \frac{2}{3}x - \frac{1}{6}$

SOLVING INEQUALITIES

Solve the inequalities.

$30 + 2x < 17$ $15 < -4x + 18$ $6 \leq 4x + 80$

$10 - 2x \leq 17$ $-12 > -3x - 12$ $-9 \leq -5x - 33$

$8 + 2x < -x + 17$ $4x - 9 \leq 5x + 80$

$5 - 2x \geq 6(x - 3)$ $-3(3 + x) \leq -6x - 11$

SUBSTITUTION TO SOLVE SYSTEMS

Solve each system by substitution.

$$\begin{cases} y = -2x \\ y = x + 3 \end{cases}$$

$$\begin{cases} y = 3x + 3 \\ x - 3y = 9 \end{cases}$$

$$\begin{cases} 2x + y = 6 \\ x = 2y - 1 \end{cases}$$

$$\begin{cases} y = \frac{2}{5}x + 3 \\ 2x - 5y = 10 \end{cases}$$

$$\begin{cases} x = -4 \\ y = 5 \end{cases}$$

$$\begin{cases} 2x + 3y = 6 \\ y = -3x - 1 \end{cases}$$

FACTORING TRINOMIALS

Factor each trinomial.

$x^2 + 5x + 4$ $x^2 + 8x + 16$ $x^2 - 6x + 8$

$x^2 - 6x - 7$ $x^2 + 5x + 6$ $x^2 - 10x + 25$

$2x^2 + 7x + 3$ $3x^2 - 13x + 4$ $5x^2 + 7x - 6$

Solve the polynomial equation.

$x^2 + 9x = -8$ $2x^2 = 7x - 3$ $3x^2 + 15x = -18$

SIMPLIFYING RADICALS

Simplify each radical expression.

$\sqrt{4}$	$\sqrt{6}$	$\sqrt{8}$	$\sqrt{9}$	$\sqrt{10}$
$\sqrt{12}$	$\sqrt{18}$	$\sqrt{25}$	$\sqrt{28}$	$\sqrt{32}$
$\sqrt{40}$	$\sqrt{48}$	$\sqrt{50}$	$\sqrt{55}$	$\sqrt{60}$
$\sqrt{64}$	$\sqrt{72}$	$\sqrt{90}$	$\sqrt{99}$	$\sqrt{120}$
$\sqrt{150}$	$\sqrt{160}$	$\sqrt{200}$	$\sqrt{256}$	$\sqrt{300}$

OPERATIONS WITH RADICALS

Simplify each radical expression.

$\sqrt{2} + \sqrt{2}$ $\quad 4\sqrt{3} + \sqrt{3}$ $\quad 5\sqrt{6} + 2\sqrt{6}$

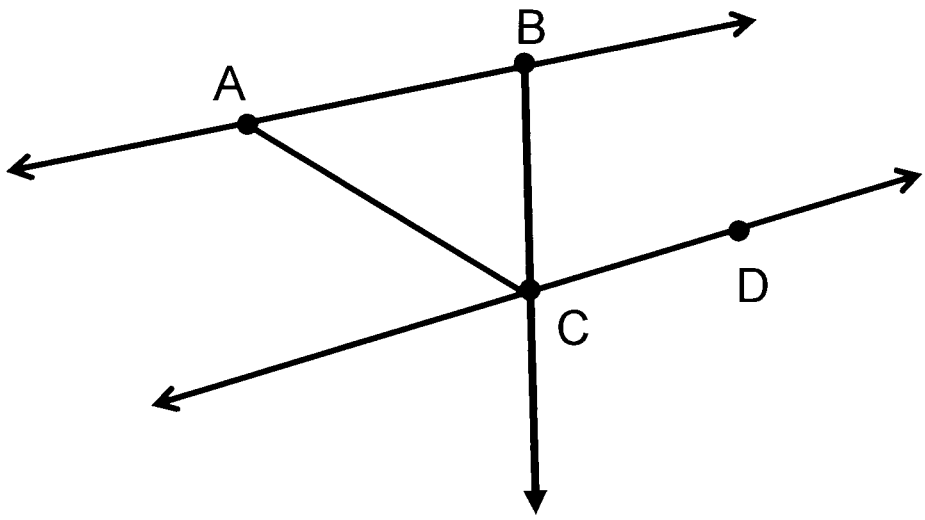
$\sqrt{2} - \sqrt{2}$ $\quad 4\sqrt{3} - \sqrt{3}$ $\quad 5\sqrt{6} - 2\sqrt{6}$

$\sqrt{2} \cdot \sqrt{2}$ $\quad 4\sqrt{3} \cdot \sqrt{3}$ $\quad 5\sqrt{6} \cdot 2\sqrt{6}$

$\sqrt{72} + \sqrt{50}$ $\quad 4\sqrt{45} - \sqrt{125}$ $\quad 5\sqrt{27} + 2\sqrt{5}$

CLASSIFYING SEGMENTS, RAYS, & LINES

Determine the segments, rays, and lines from the diagram.



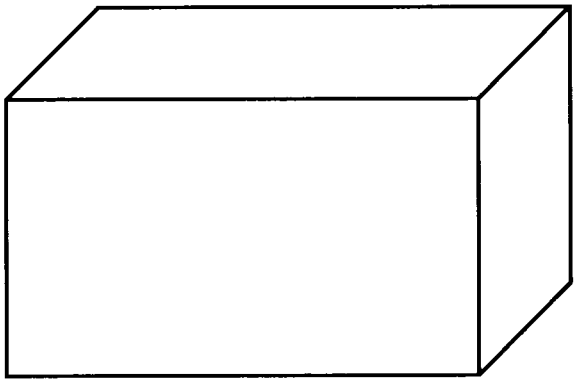
SEGMENTS	RAYS	LINES

Determine whether each statement is true or false.

Two lines can intersect at exactly one point.	
Two lines can intersect at exactly two points.	
The are an infinite number of points on a line.	
A ray has an arrow at one end.	
A segment and a line are identical.	

NUMBER OF EDGES & VERTICES

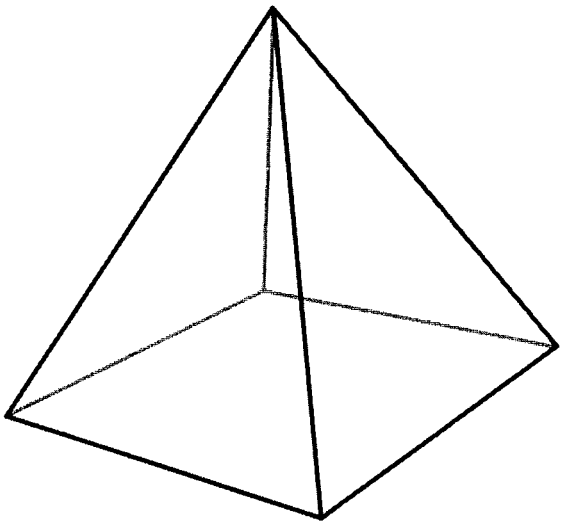
List the number of edges and vertices for each figure.



rectangular prism

edges:

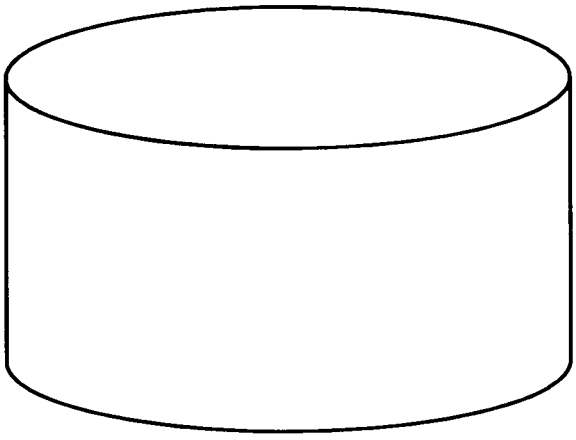
vertices:



square pyramid

edges:

vertices:



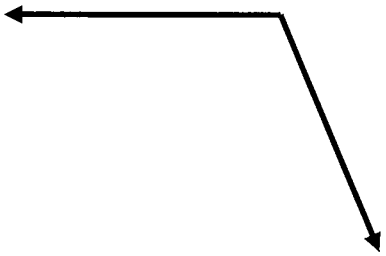
cylinder

edges:

vertices:

ANGLE MEASUREMENTS

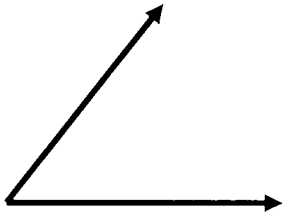
Circle the type of angle shown and the best approximate measure of the angle.



acute 60

obtuse 100

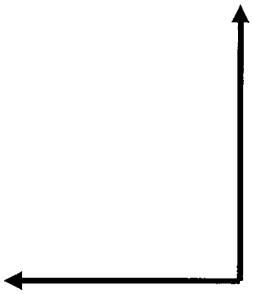
right 90



acute 60

obtuse 100

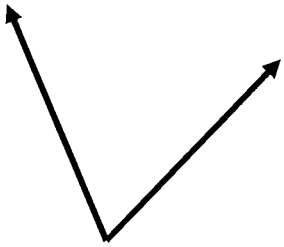
right 90



acute 60

obtuse 100

right 90



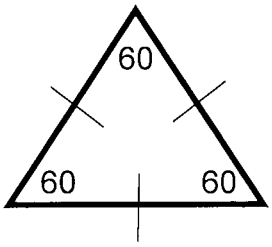
acute 60

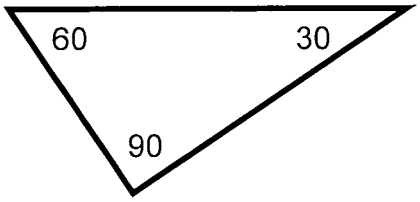
obtuse 100

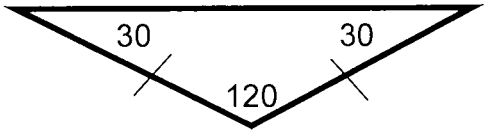
right 90

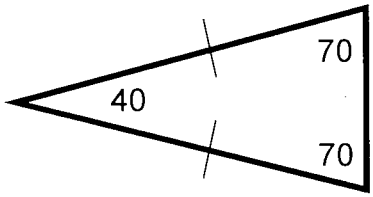
TYPES OF TRIANGLES

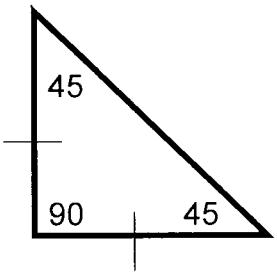
Name the triangle based on its sides and angles.
Names include equilateral, isosceles, and scalene, acute, obtuse, and right.

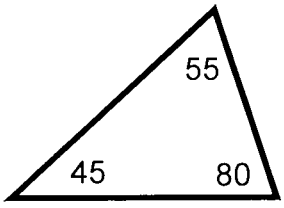






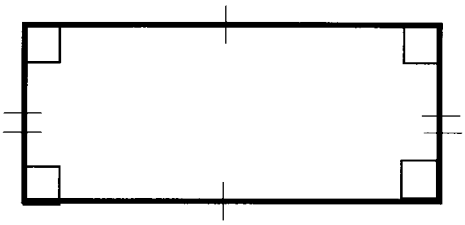


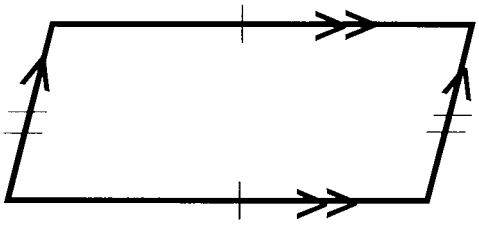


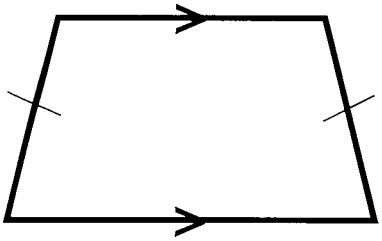


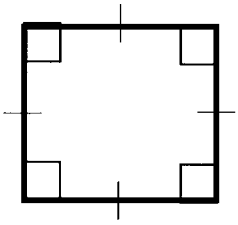
TYPES OF QUADRILATERALS

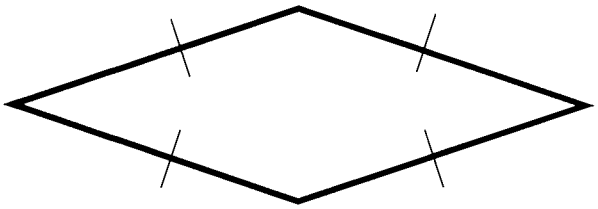
Determine if the quadrilateral is a square, rectangle, rhombus, trapezoid, isosceles trapezoid, parallelogram, or more than one of those names.





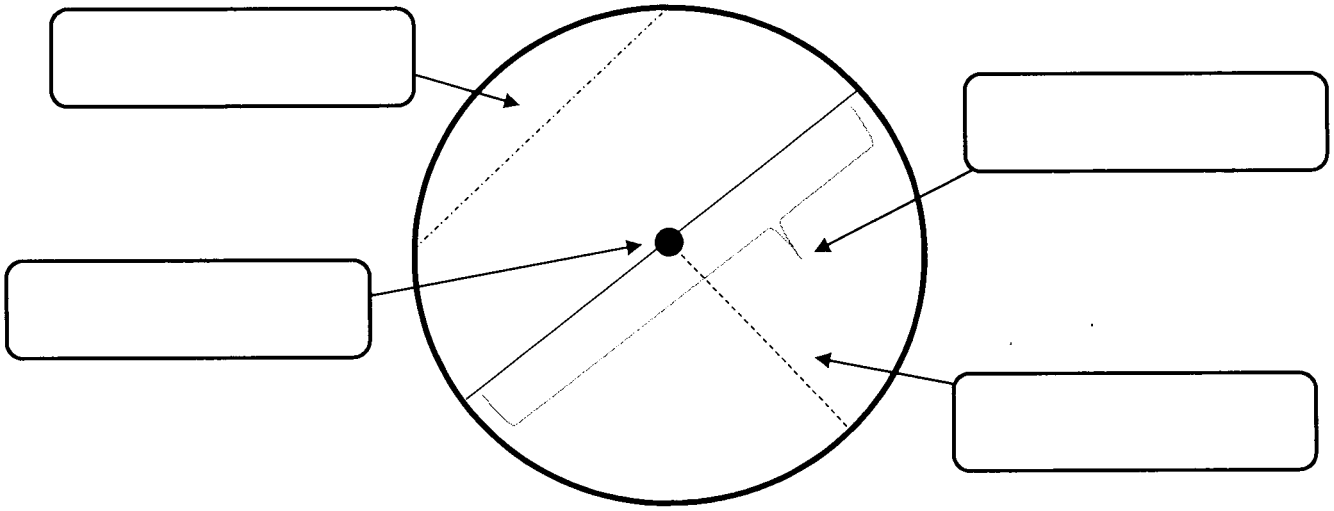




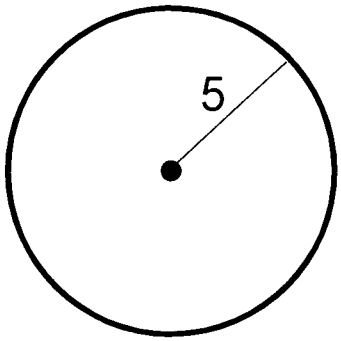


PARTS OF A CIRCLE

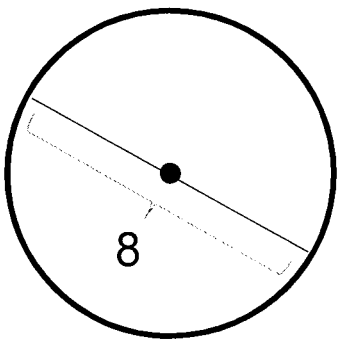
Given the circle, name each part.



Find the circumference and area of each circle.



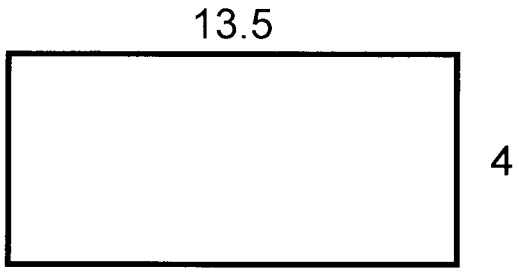
Circumference: $C = 2\pi r$ Area: $A = \pi r^2$



Circumference: $C = \pi d$ Area: $A = \pi r^2$

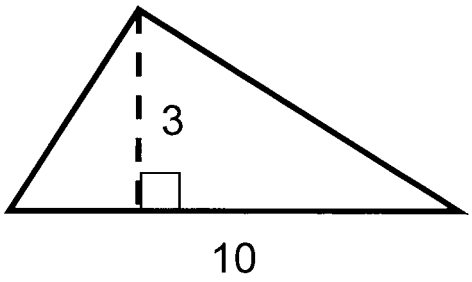
AREA FORMULAS

Calculate the area of each figure.



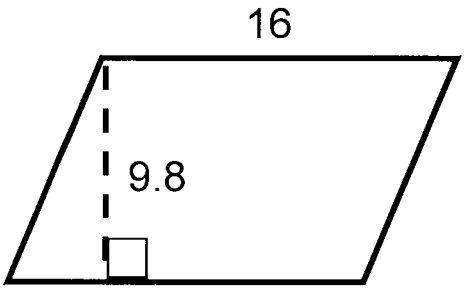
rectangle

$A = lw$



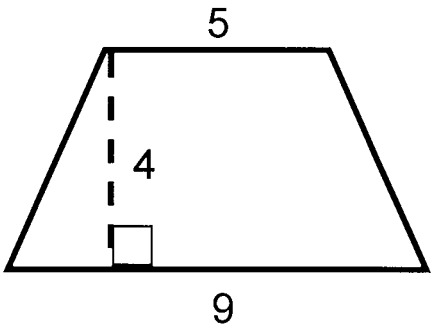
triangle

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



parallelogram

$A = bh$

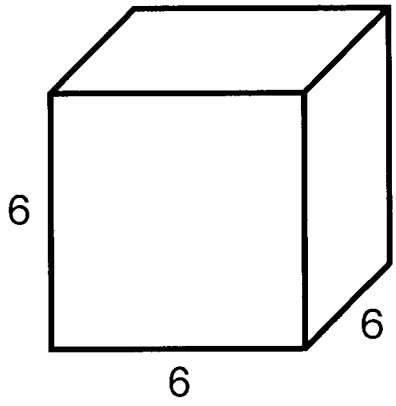


trapezoid

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

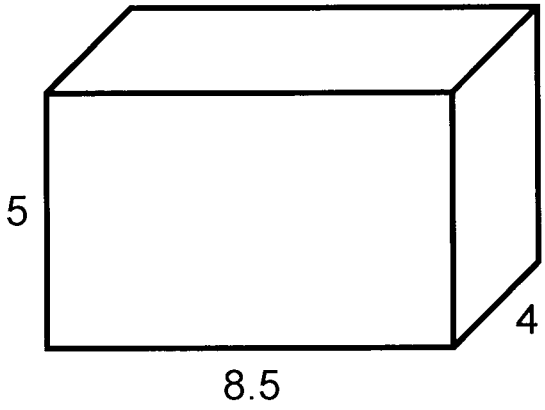
VOLUME FORMULAS

Calculate the volume of each figure.



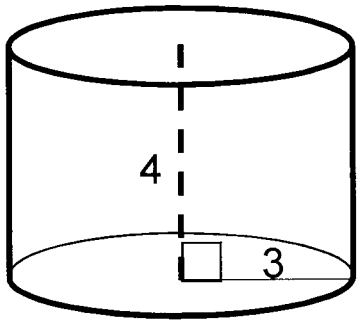
cube

$V = s^3$



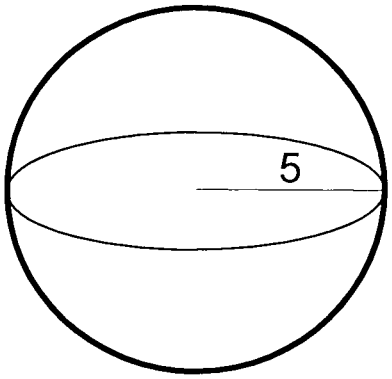
rectangular prism

$V = lwh$



cylinder

$V = \pi r^2 h$

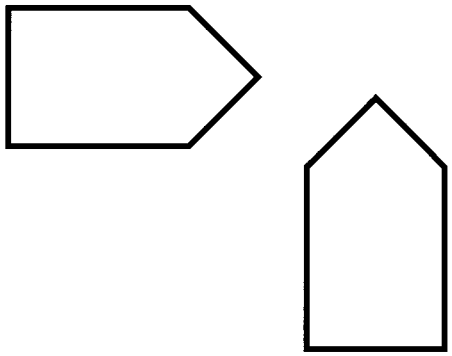


sphere

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

TRANSFORMATIONS

Determine the type of transformation shown in each diagram as a translation, rotation, reflection, or dilation.



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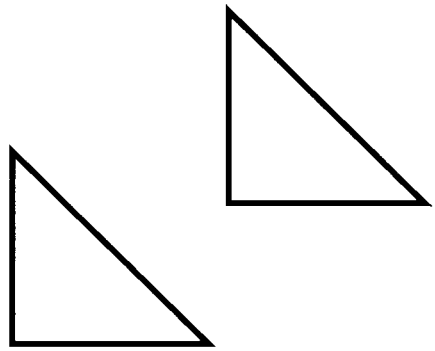

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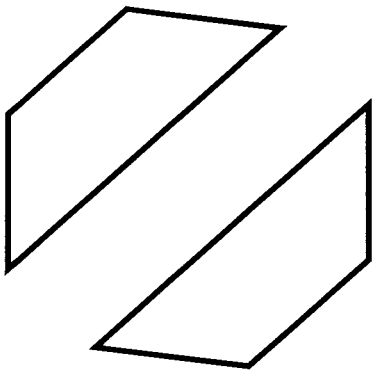

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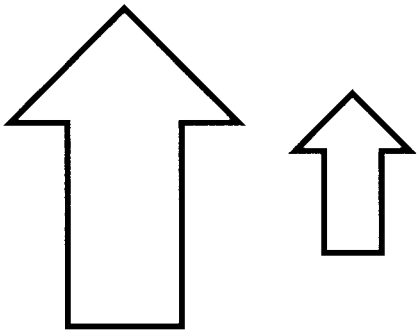

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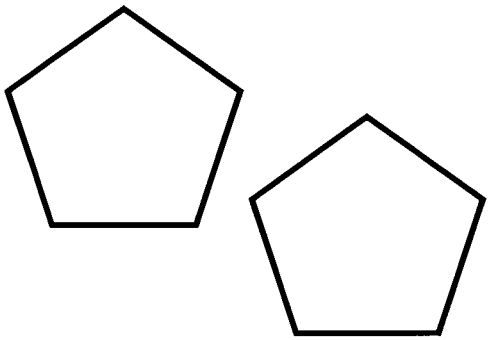
CONGRUENT OR SIMILAR

Determine whether the figures shown are congruent or similar.



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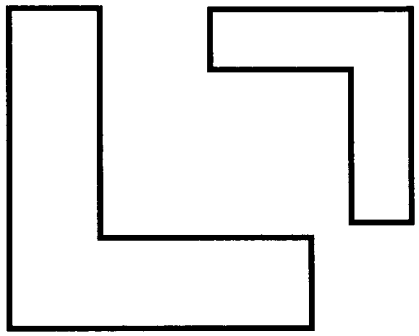

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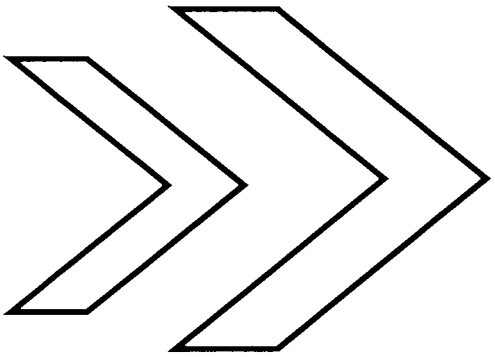

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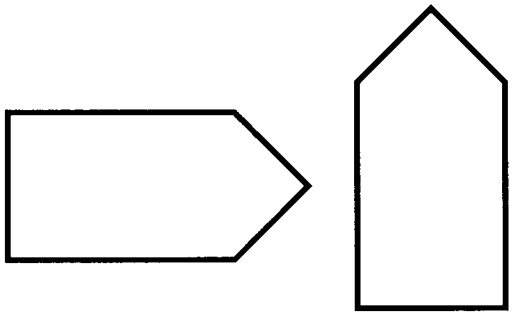

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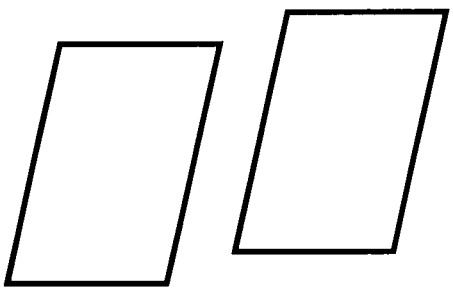

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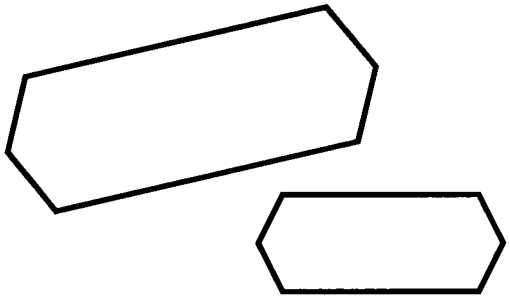

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Name: _____

Date: _____

Geometry
Summer Packet

1) Solve. Leave answers in fraction form.

a) $3x - 7 = -2$

b) $\frac{p}{2} - 6 = -1$

c) $9m + 8 - m = 1 + 10m - 2$

d) $2(r - 3) = 6r + 10$

e) $\frac{2}{3}(6x - 15) + 5x = 26$

f) $\frac{5}{8} = \frac{3}{4}b - \frac{7}{12}$

g $0.6(y - 0.2) = 3 - 0.2(y - 1)$

h) $6b - 27 = 3(5b - 2)$

i) $\frac{x}{5} = \frac{20}{4}$

j) $\frac{y+2}{4} = \frac{y-6}{2}$

2) Rearrange each equation into slope-intercept form.

a) $3x + 6y = -12$

b) $4x - 8y = 16$

c) $\frac{3}{4}x + \frac{1}{2}y = \frac{3}{8}$

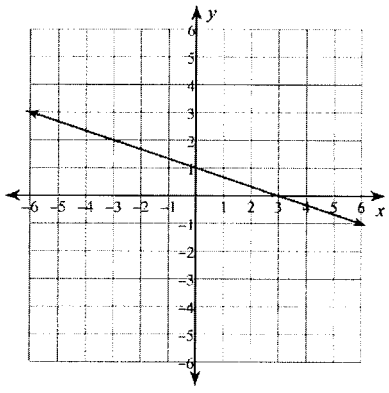
d) $10y - 5x = 20$

3) Use the given information to write an equation in slope intercept form.

a) A line with a slope of $\frac{1}{4}$ and passes through the point $(-4, 10)$.

b) A line that passes through $(-1, -2)$ and $(-4, -11)$.

c)

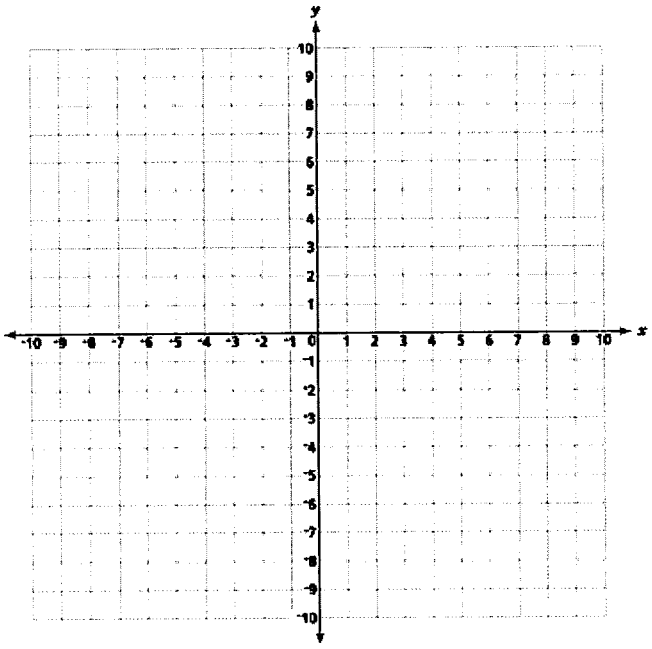


d)

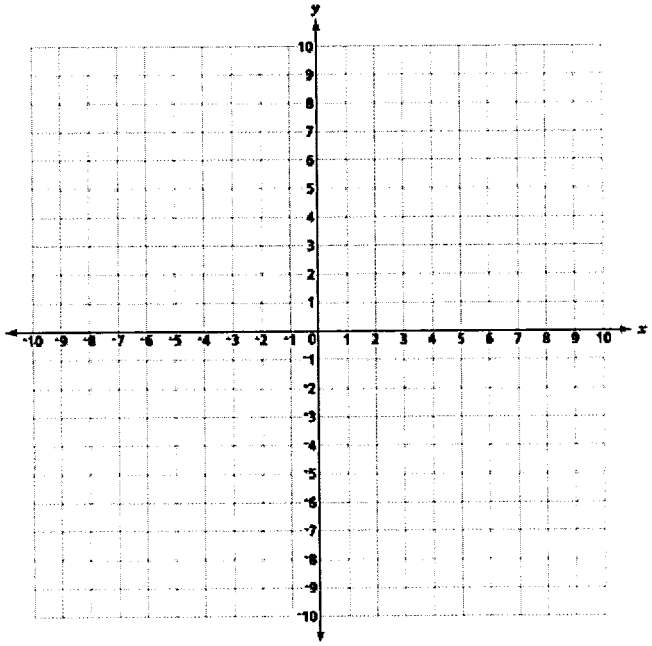
x	y
-1	2
-2	4
-3	6
-4	8
-5	10

4) Graph.

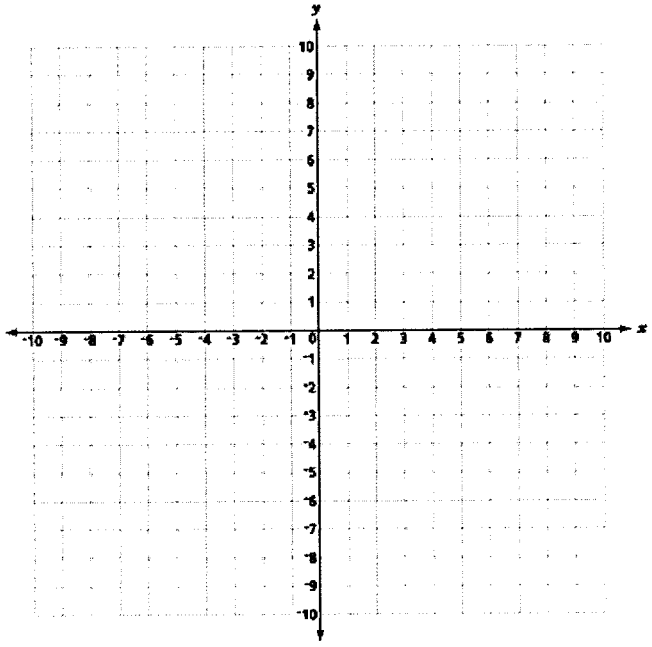
a) $y = \frac{2}{5}x - 9$



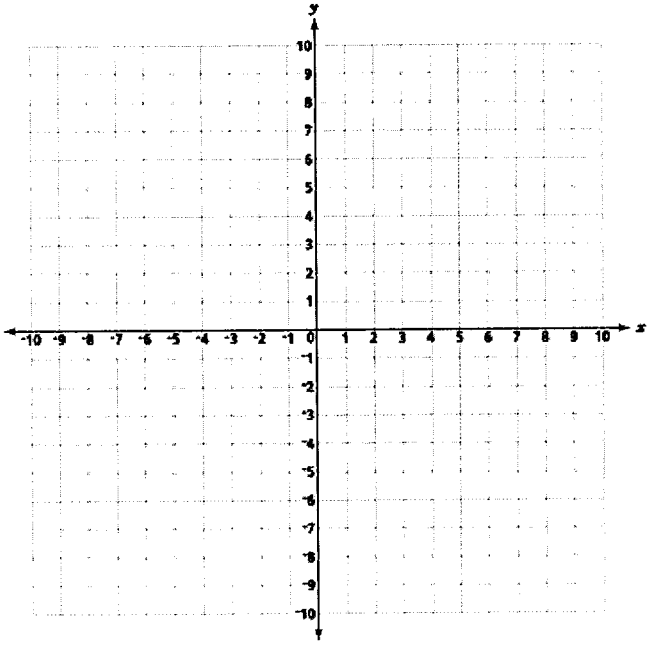
b) $y - 3 = \frac{1}{2}(x - 4)$



c) $y = -\frac{2}{3}x$



d) $y = 5$



5) Solve each system using substitution or elimination.

a) $y = \frac{1}{3}x + 2$
$y = -x - 2$

b) $2x + y = 2$
$y = -2x - 1$

c) $5x + 2y = 6$
$4x - 8y = 0$

d) $2x + 5y = 14$
$x + 3y = 16$

6) Perform the indicated operation.

a) $(5x^2 - x + 5) + (2x^2 - x - 8)$

b) $(-8x^2 - 10x + 8) - (x^2 + 4x + 8)$

c) $3x^5(-2x^3 + 4x^2 - 3)$

d) $(x + 3)(2x^2 + x - 8)$

e) $(x - 4)^2$

f) $2(6x - 3)^2$

7) Factor by grouping.

a) $4x^3 + 12x^2 - 25x - 75$

b) $7x^3 + 3x^2 - 28x - 12$

c) $3x^3 - 3x^2 - 8x + 8$

8) Factor each trinomial.

a) $3x^2 + 9x - 30$

b) $x^2 - 6x - 16$

c) $8x^4 - 4x^3 - 24x^2$

d) $4x^2 + 7x - 2$

e) $x^2 - 6x - 7$

f) $x^2 - 10x + 21$

9) Simplify.

a) $\sqrt{20}$

b) $\sqrt{72}$

c) $\sqrt{200}$

d) $\sqrt{48}$

e) $\frac{\sqrt{60}}{4}$

f) $-3\sqrt{84}$