Algebra I Summer Practice

Expectations:

- Students are expected to complete this assignment independently, without a tutor.
- For each question in this assignment, show all of your work in the space provided.
    - Your work must be clearly labeled and easy to follow.
- Box your final answers.
- Check your final answers with the key.
- **This assignment will be graded for <u>completion</u> and entered as a quiz grade.**
    - **You are expected to**
        - **complete every problem.**
        - **check your answers with the key.**
        - **mark the questions you answered incorrectly.**
- **This assignment is DUE on the first day of your Algebra 1 class.**
    - **If you turn in this assignment after the first day of school, 10 percentage points will be deducted for each day it is late.**

Students entering Algebra I are expected to know how to:

- **evaluate expressions**
- **apply the order of operations**
- **simplify expressions**
- **write algebraic expressions, equations and inequalities**
- **represent functions as rules, tables and graphs**
- **identify relations as functions evaluate square roots and compare numbers**
- **classify numbers as real, rational, irrational, integer, whole or natural**
- **solve linear equations**
- **one-step equations**
- **two-step equations**
- **multi-step equations**
- **with variables on both sides**
- **write and solve proportions**
- **write and solve linear equations**
- **rewrite equations and formulas**
- **plot points in a coordinate plane**
- **identify x and y-intercepts**
- **find the slope between two points**
- **graph linear equations written in slope-intercept form**

These skills will be incorporated into the Algebra I course throughout the school year.

As a member of the Sacred Heart Community,
I pledge to act in a moral, ethical, honest, and honorable way in all that I do.

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TABLE OF CONTENTS

PAGE	TOPIC
1	VARIABLES AND EXPRESSIONS
2	ORDER OF OPERATIONS
3	NUMBER PROPERTIES
4	EVALUATING EXPRESSIONS
5	ADDING & SUBTRACTING FRACTIONS
6	MULTIPLYING AND DIVIDING FRACTIONS
7	COMBINING LIKE TERMS
8	SOLVING ONE-STEP EQUATIONS
9	SOLVING TWO-STEP EQUATIONS
10	RATIOS
11	SOLVING PROPORTIONS
12	GRAPHING INEQUALITIES ON A NUMBER LINE
13	THE COORDINATE PLANE
14	GRAPHING BY MAKING A TABLE
15	SLOPE & y-INTERCEPT OF A LINEAR EQUATION
16	BASIC EXPONENT RULES
17	SEQUENCES & PATTERNS
18	CALCULATING PERIMETER
19	CALCULATING AREA
20	PERFECT SQUARE NUMBERS

VARIABLES & EXPRESSIONS

Translate each algebraic expression or verbal expression.

VERBAL EXPRESSION	ALGEBRAIC EXPRESSION
8 times a number x is subtracted by 4	
	$6x^2 + 7$
5 increased by the product of -3 and a number x	
	$3x + 4y - 2$
3 times the sum of a number x and 7	
	$\frac{x}{2} + 4x$
A number y cubed plus x squared decreased by 7	
	$5(x - 4) + 2$
the difference of x and y is divided by 3 and added by 8	
	$-2(x + 4)^2 - 1$

ORDER OF OPERATIONS

Simplify each expression using the order of operations.

1. $5 – 6 + 2(3)$	2. $4 + 5(7 – 1) + \frac{8}{2}$
3. $-9(4 + 2) - 2(3) + 4^2$	4. $7 – 2[-6 – (3 + 1)] - \frac{8 + 7}{3}$
5. $0.5(-8 - 4) + 3(8 - 2^2)$	6. $3 – 5(2) – 7(5^2 – 4^2)$
7. $2(3)^2 – 4(3) + 1$	8. $4(3 - 5)^3 + 5$

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

EVALUATING EXPRESSIONS

Evaluate each expression given the following values for each variable.

a = 2	b = -3	c = 4	d = -5	e = 6	f = -7

1. $2a + 3d$	2. $b^2 - e^2$
3. $-3c - (a + d) + f$	4. $2(b - e) + (f + c)^2$
5. $\frac{d - c}{3} - 4(ab + f)$	6. $c(ab - 1) + de - f^2$

ADDING & SUBTRACTING FRACTIONS

Add or subtract the fractions. Simplify your answer.

$\frac{1}{2} + \frac{1}{2} =$ $\frac{1}{3} + \frac{1}{3} =$ $\frac{1}{4} + \frac{2}{4} =$

$\frac{2}{5} - \frac{1}{5} =$ $\frac{3}{6} - \frac{5}{6} =$ $\frac{1}{7} - \frac{8}{7} =$

$\frac{5}{8} - \frac{7}{8} =$ $-\frac{5}{9} - \frac{1}{9} =$ $-\frac{3}{10} + \frac{7}{10} =$

$\frac{1}{2} + \frac{5}{4} =$ $\frac{2}{9} + \frac{1}{3} =$ $\frac{1}{4} + \frac{2}{16} =$

$\frac{2}{3} - \frac{1}{5} =$ $\frac{3}{6} - \frac{5}{4} =$ $\frac{1}{2} - \frac{8}{7} =$

$\frac{5}{8} - \frac{7}{5} =$ $-\frac{5}{4} - \frac{1}{9} =$ $-\frac{3}{10} + \frac{7}{3} =$

MULTIPLYING & DIVIDING FRACTIONS

Multiply or divide the fractions. Simplify your answer.

$\frac{5}{2} \bullet \frac{1}{2} =$

$\frac{1}{3} \bullet \frac{1}{3} =$

$\frac{1}{4} \bullet \frac{2}{4} =$

$-\frac{2}{5} \bullet \frac{3}{5} =$

$\frac{3}{6} \bullet -\frac{5}{6} =$

$-\frac{1}{4} \bullet -\frac{8}{7} =$

$4\left(\frac{5}{8}\right) =$

$-3\left(\frac{2}{3}\right) =$

$-2\left(\frac{4}{9}\right) =$

$\frac{1}{2} \div \frac{5}{4} =$

$\frac{2}{9} \div \frac{1}{3} =$

$\frac{1}{4} \div \frac{2}{5} =$

$-\frac{2}{3} \div \frac{1}{5} =$

$\frac{3}{6} \div -\frac{5}{4} =$

$-\frac{1}{2} \div -\frac{8}{7} =$

COMBINING LIKE TERMS

Combine like terms for each expression.

EXPRESSION	SIMPLIFIED
x + x + 3x + y	
y + 2y + 5x + x	
5 + z + z + 4z – 6	
3x + 4x - 5	
5c + 2b – 3c	
x + y + 2x	
6a – 5b + a	
4 + 3x – 7 – 8x	
3(x + 2) - 4	
-5(x – 3) + 7x	
5m – 6n – 9m	
-8a – 9b – 10a + 9b	
2(x + 4) + 5x - 3	
-10(2 + x) – 3x	

SOLVING ONE-STEP EQUATIONS

Solve the one-step equations.

$x + 7 = 9$

$5 + x = -3$

$6 = x + 8$

$x - 9 = 1$

$-5 + x = -2$

$4 = x - 7$

$5x = 75$

$-2x = -64$

$-7.5 = 1.25x$

$\frac{x}{4} = 7$

$-\frac{x}{2} = 8$

$-3 = -\frac{x}{9}$

$\frac{3}{4}x = 7$

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

$-5 = -\frac{2}{9}x$

SOLVING TWO-STEP EQUATIONS

Solve the two-step equations. Leave your answer as a simplified fraction.

$2x + 7 = 9$

$5 + 4x = -3$

$6 = 2x + 8$

$4x - 9 = 1$

$-5 + 3x = -2$

$4 = -x - 7$

$5x + 10 = 75$

$-2x + 8 = -64$

$-7.5 = 1.25x + 2.5$

$\frac{x}{4} - 6 = 7$

$-\frac{x}{2} + 3 = 8$

$-3 = 8 - \frac{x}{9}$

$\frac{3}{4}x + 5 = 7$

$-\frac{1}{2}x - 4 = 8$

$-5 = -\frac{2}{9}x + 2$

RATIOS

Create the ratios for each situation.

To create a perfect fruit smoothie for you and your friends, you must use 5 strawberries, 9 blueberries, 1 banana, 4 slices of pineapple, and 3 slices of mango.

FRUIT	RATIO
strawberries to blueberries	
strawberries to pineapple	
pineapple to mango	
mango to banana	
banana to blueberries	
mango to blueberries	
pineapple to berries	
mango to the smoothie	
pineapple to the smoothie	
berries to the smoothie	
berries to non-berries	
smoothie to blueberries	
smoothie to mango	

SOLVING PROPORTIONS

Solve each proportion. Leave your answer as a simplified fraction or decimal.

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

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

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

$\frac{x}{7} = \frac{1}{6}$

$\frac{6}{x} = \frac{2.5}{2}$

$\frac{4.5}{3} = \frac{9}{x}$

$\frac{x}{3} = \frac{4.2}{10}$

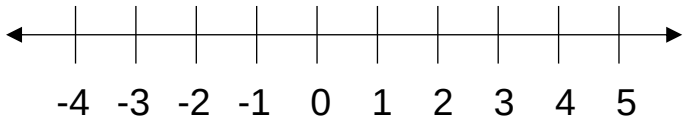
$\frac{11}{x} = \frac{2.5}{5.5}$

$\frac{6}{5} = \frac{12}{x}$

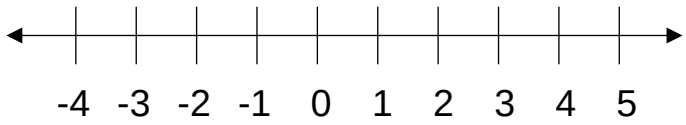
GRAPHING INEQUALITIES

Graph each inequality on the number line shown.

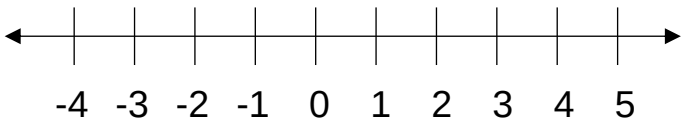
$x > 2$



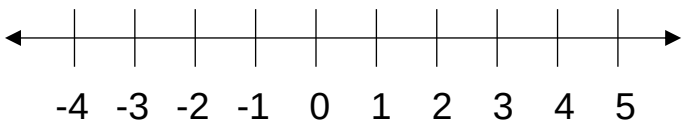
$x < -3$



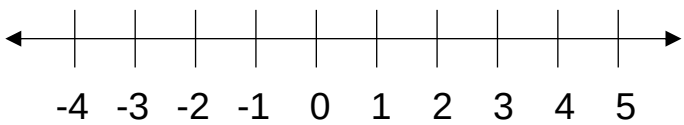
$x \geq -1$



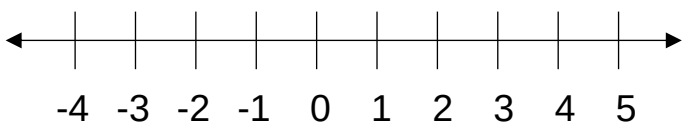
$x \leq 4$



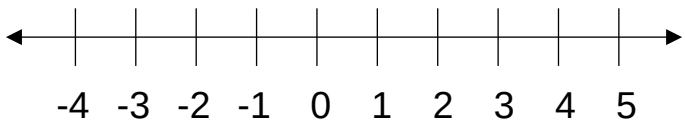
$x < 0$



$x \geq 0$



$x > -2$

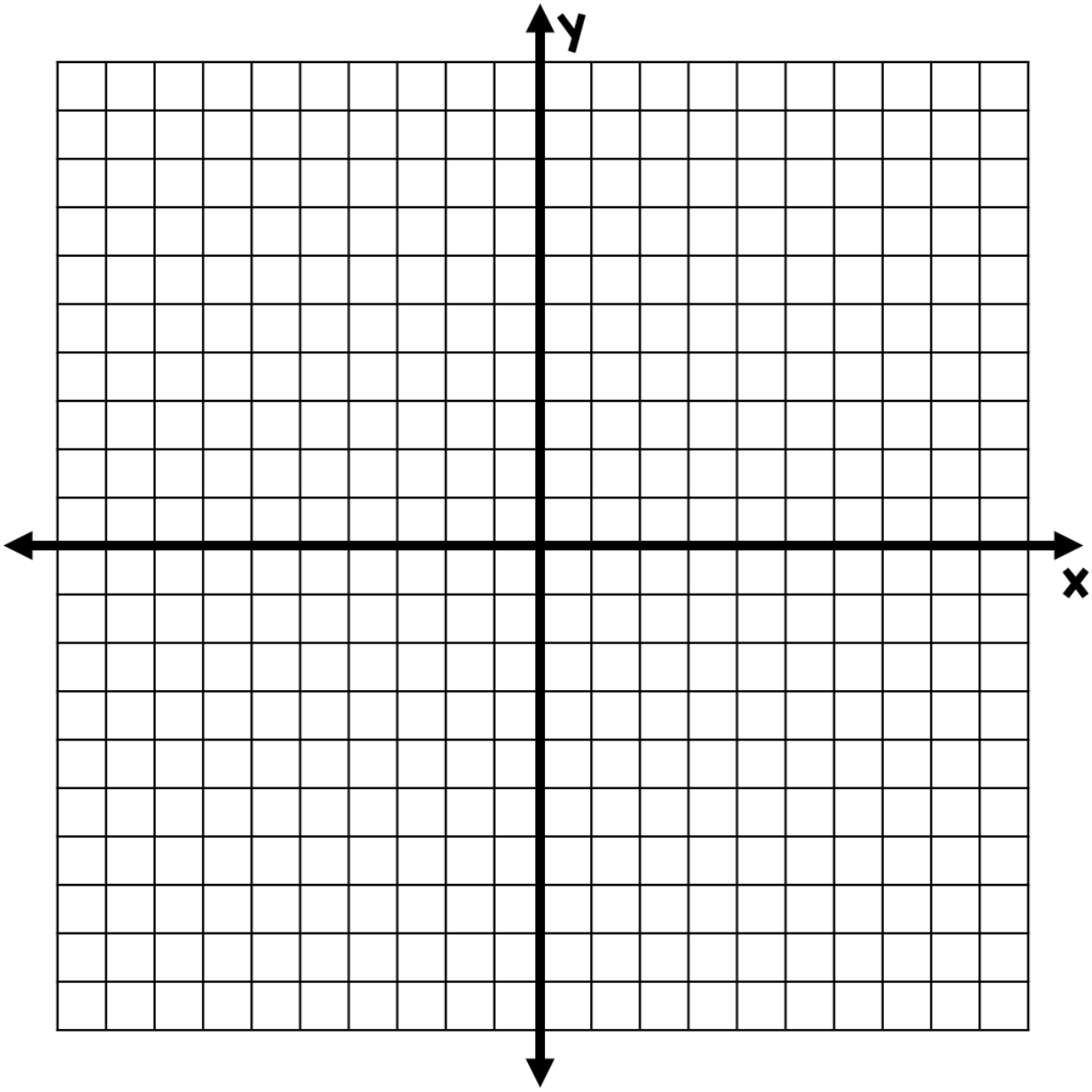


THE COORDINATE PLANE

Plot each point on the coordinate plane and name the quadrant the point is in.

POINT	QUADRANT
A(3, 4)	
B(5, -7)	
C(0, -5)	
D(-9, 2)	

POINT	QUADRANT
E(-1, -2)	
F(-8, 0)	
G(10, 3)	
H(-4, 8)	

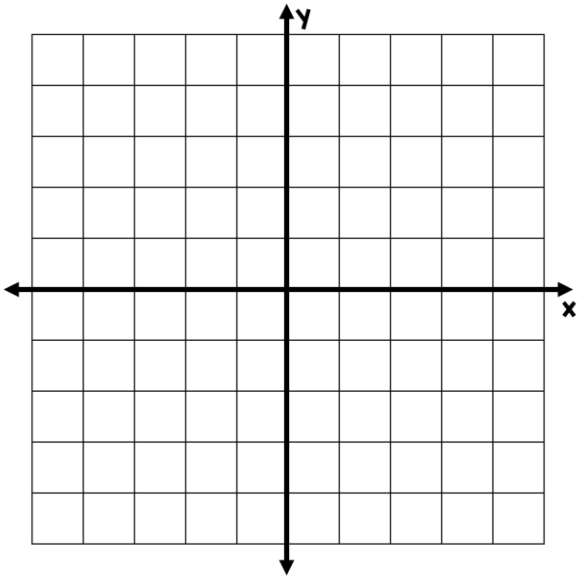


GRAPHING BY MAKING A TABLE

Graph the equations by using substitution to complete a table of values.

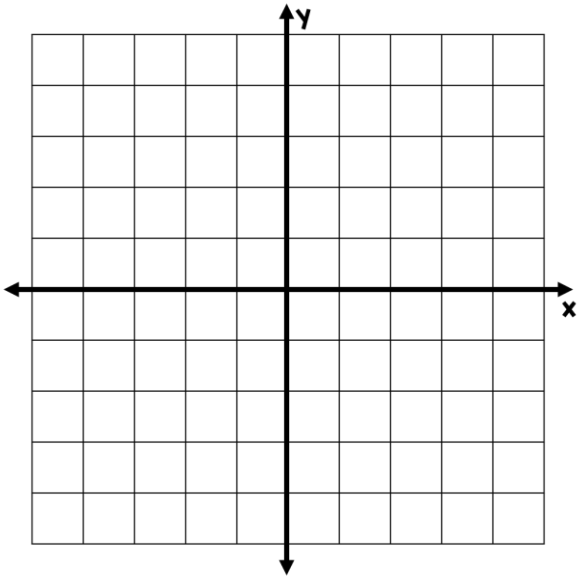
$y = x + 2$

x	y
-2	
-1	
0	
1	
2	



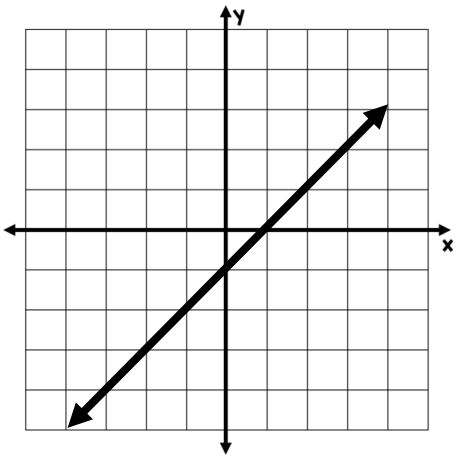
$y = 2x - 1$

x	y
-2	
-1	
0	
1	
2	

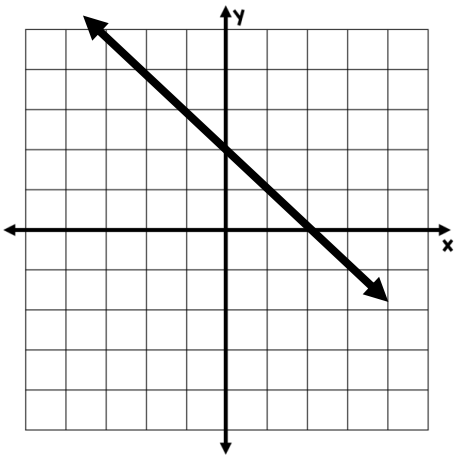


SLOPE & y-INTERCEPT

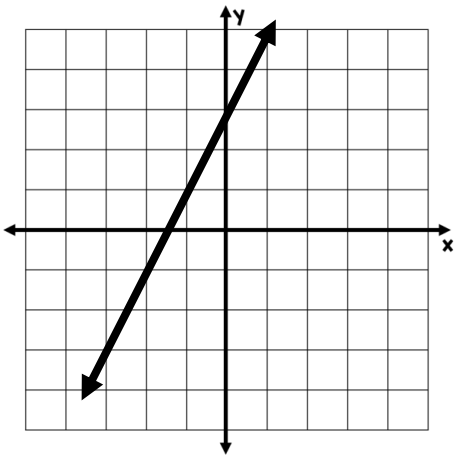
Determine the slope and the y-intercept of each graph.



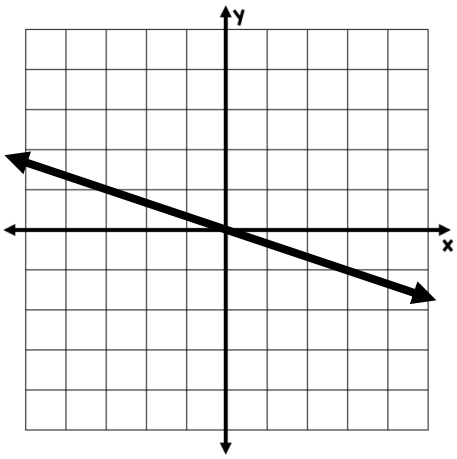
slope:	
y-intercept:	



slope:	
y-intercept:	



slope:	
y-intercept:	



slope:	
y-intercept:	

BASIC EXPONENT RULES

Simplify each expression using exponent rules.

EXPRESSION	SIMPLIFIED
$x \cdot x$	
$y \cdot y \cdot y \cdot y$	
$x \cdot x \cdot y \cdot y \cdot y$	
$y \cdot z \cdot z \cdot z \cdot z \cdot z$	
$x^2 \cdot x^3$	
$x^5 \cdot x^4$	
$y^6 \cdot y$	
$(x^4)^3$	
$(y^3)^2$	
$x^2 \cdot x \cdot y^3 \cdot y^4$	
$a^4 \cdot b^8 \cdot a^5 \cdot b^2$	
$c^3 \cdot d \cdot c^4 \cdot b$	
$\frac{x^5}{x^2}$	
$\frac{y^8}{y^3}$	

SEQUENCES & PATTERNS

Determine the pattern of each sequence and find the next 3 terms.

2, 4, 8, 16, 32, _____, _____, _____

5, 10, 15, 20, 25, _____, _____, _____

-5, -3, -1, 1, 3, _____, _____, _____

0.4, 0.2, 0, -0.2, -0.4, _____, _____, _____

3, -6, 12, -24, 48, _____, _____, _____

$\frac{3}{9}, \frac{4}{9}, \frac{5}{9}, \frac{6}{9}, \frac{7}{9}$, _____, _____, _____

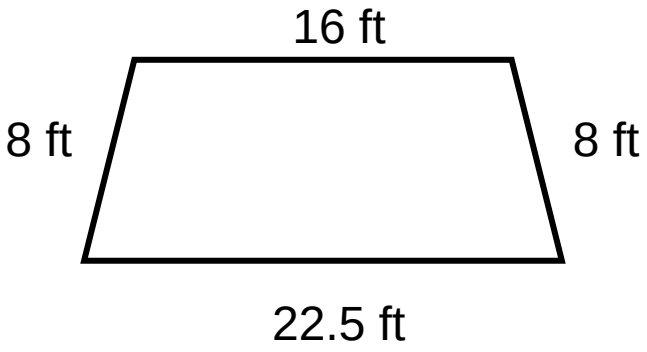
$\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \frac{1}{32}$, _____, _____, _____

6, -3, -12, -21, -30, _____, _____, _____

0.32, 0.8, 2, 5, 12.5, _____, _____, _____

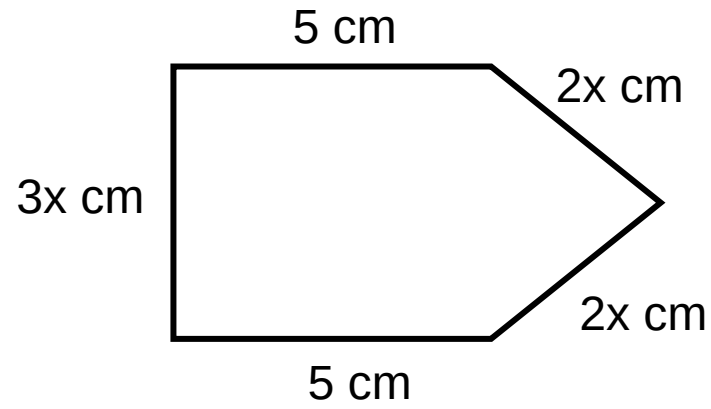
CALCULATING PERIMETER

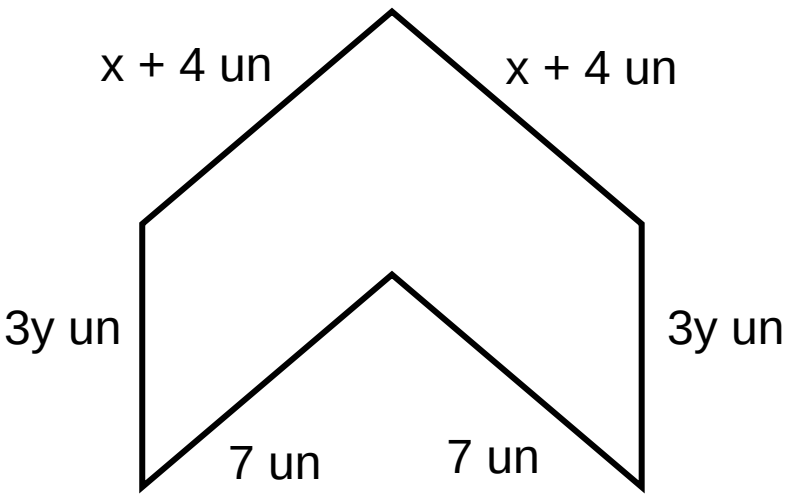
Determine the perimeter of each figure.



P =

P =





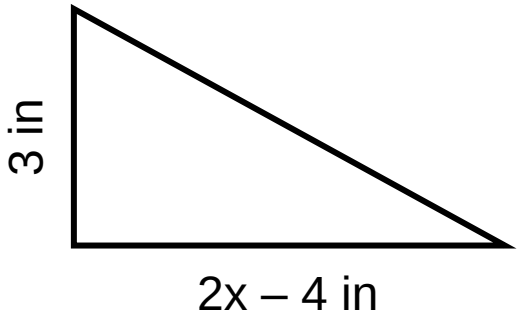
P =

CALCULATING AREA

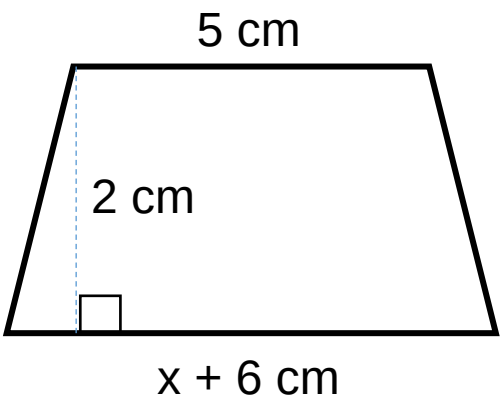
Determine the area of each figure.



A =



A =



A =

PERFECT SQUARE NUMBERS

Complete the perfect squares chart. Fill in as many as you can without a calculator.

$1^2 =$		$16^2 =$	
$2^2 =$		$17^2 =$	
$3^2 =$		$18^2 =$	
$4^2 =$		$19^2 =$	
$5^2 =$		$20^2 =$	
$6^2 =$		$21^2 =$	
$7^2 =$		$22^2 =$	
$8^2 =$		$23^2 =$	
$9^2 =$		$24^2 =$	
$10^2 =$		$25^2 =$	
$11^2 =$		$30^2 =$	
$12^2 =$		$40^2 =$	
$13^2 =$		$50^2 =$	
$14^2 =$		$60^2 =$	
$15^2 =$		$70^2 =$	

ANSWER KEY

ANSWER KEY

VARIABLES & EXPRESSIONS

Translate each algebraic expression or verbal expression.

VERBAL EXPRESSION	ALGEBRAIC EXPRESSION
8 times a number x is subtracted by 4	$8x - 4$
the product of 6 and a number x squared is increased by 7	$6x^2 + 7$
5 increased by the product of -3 and a number x	$5 - 3x$
3 times the number x plus 4 times the number y is decreased by 2	$3x + 4y - 2$
3 times the sum of a number x and 7	$3(x + 7)$
the quotient of x and 2 is added by the product of 4 and x	$\frac{x}{2} + 4x$
A number y cubed plus x squared decreased by 7	$y^3 + x^2 - 7$
5 times the difference of x and 4 is added by 2	$5(x - 4) + 2$
the difference of x and y is divided by 3 and added by 8	$\frac{x - y}{3} + 8$
negative 2 times the square of the sum of a number x and 4 is subtracted by 1	$-2(x + 4)^2 - 1$

ANSWER KEY

ORDER OF OPERATIONS

Simplify each expression using the order of operations.

1. $5 - 6 + 2(3)$

$5 - 6 + 6$

$-1 + 6$

$\boxed{5}$

2. $4 + 5(7 - 1) + \frac{8}{2}$

$4 + 5(6) + 4$

$4 + 30 + 4$

$34 + 4$

$\boxed{38}$

3. $-9(4 + 2) - 2(3) + 4^2$

$-9(6) - 6 + 16$

$-54 - 6 + 16$

$-60 + 16$

$\boxed{-44}$

4. $7 - 2[-6 - (3 + 1)] - \frac{8 + 7}{3}$

$7 - 2[-6 - 4] - \frac{15}{3}$

$7 - 2[-10] - 5$

$7 + 20 - 5$

$27 - 5$

$\boxed{22}$

5. $0.5(-8 - 4) + 3(8 - 2^2)$

$0.5(-12) + 3(8 - 4)$

$0.5(-12) + 3(4)$

$-6 + 12$

$\boxed{6}$

6. $3 - 5(2) - 7(5^2 - 4^2)$

$3 - 10 - 7(25 - 16)$

$3 - 10 - 7(9)$

$3 - 10 - 63$

$-7 - 63$

$\boxed{-70}$

7. $2(3)^2 - 4(3) + 1$

$2(9) - 12 + 1$

$18 - 12 + 1$

$6 + 1$

$\boxed{7}$

8. $4(3 - 5)^3 + 5$

$4(-2)^3 + 5$

$4(-8) + 5$

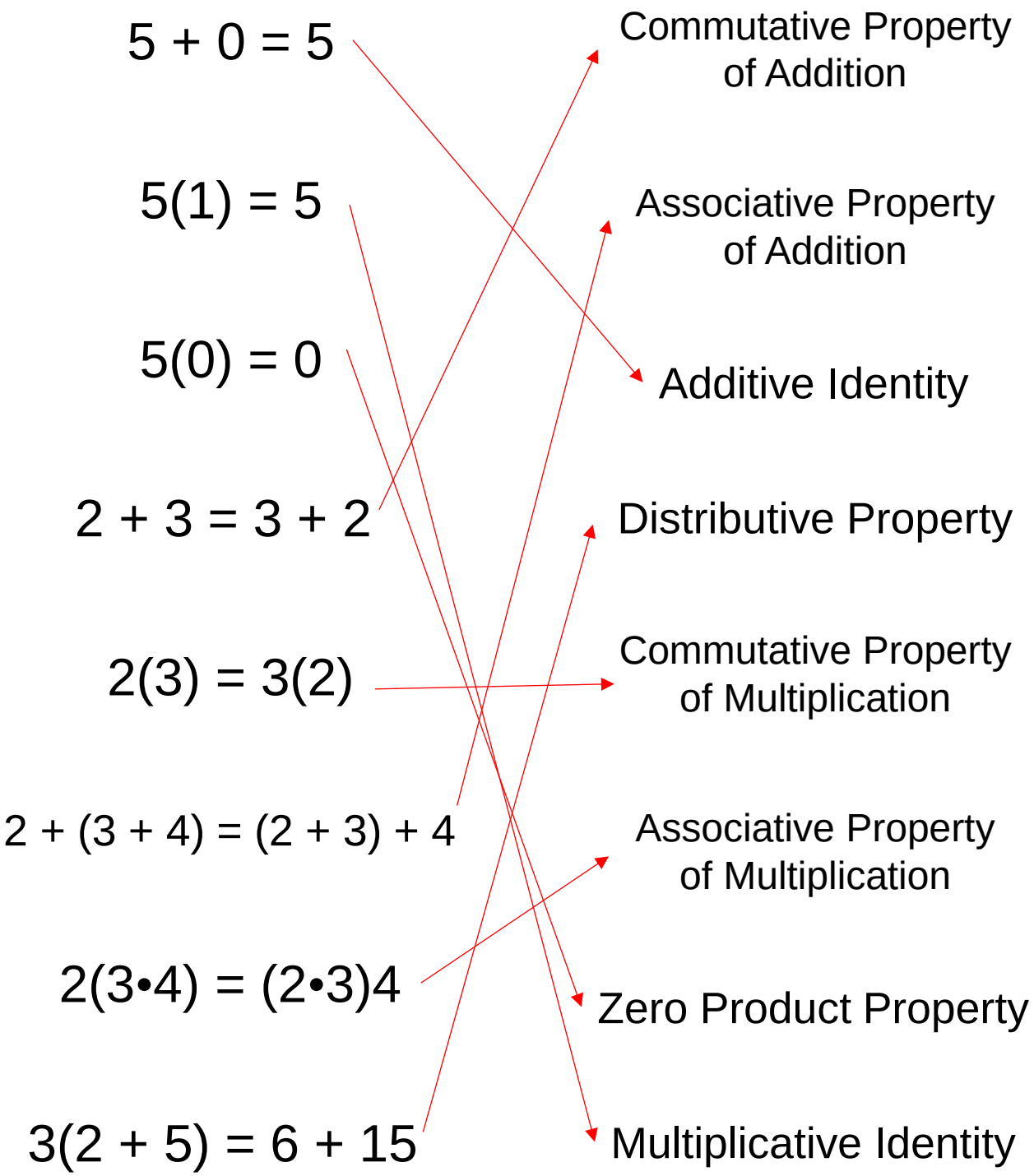
$-32 + 5$

$\boxed{-27}$

ANSWER KEY

THE NUMBER PROPERTIES

Match each expression with the property that it shows.



ANSWER KEY

EVALUATING EXPRESSIONS

Evaluate each expression given the following values for each variable.

a = 2	b = -3	c = 4	d = -5	e = 6	f = -7

1. $2a + 3d$

$2(2) + 3(-5)$

$4 + 3(-5)$

$4 - 15$

$\boxed{-11}$

2. $b^2 - e^2$

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

$9 - 36$

$\boxed{-27}$

3. $-3c - (a + d) + f$

$-3(4) - [2 + (-5)] + (-7)$

$-12 - [-3] - 7$

$-12 + 3 - 7$

$-9 - 7$

$\boxed{-16}$

4. $2(b - e) + (f + c)^2$

$2(-3 - 6) + (-7 + 4)^2$

$2(-9) + (-3)^2$

$-18 + 9$

$\boxed{-9}$

5. $\frac{d - c}{3} - 4(ab + f)$

$\frac{-5 - 4}{3} - 4[2(-3) + (-7)]$

$\frac{-9}{3} - 4[-6 - 7]$

$-3 - 4[-13]$

$-3 + 52$

$\boxed{49}$

6. $c(ab - 1) + de - f^2$

$4[(2)(-3) - 1] + (-5)(6) - (-7)^2$

$4[-6 - 1] - 30 - 49$

$4[-7] - 30 - 49$

$-28 - 30 - 49$

$-58 - 49$

$\boxed{-107}$

ADDING & SUBTRACTING FRACTIONS

Add or subtract the fractions. Simplify your answer.

$\frac{1}{2} + \frac{1}{2} = \frac{2}{2} = 1$

$\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$

$\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$

$\frac{2}{5} - \frac{1}{5} = \frac{1}{5}$

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

$\frac{1}{7} - \frac{8}{7} = -\frac{7}{7} = -1$

$\frac{5}{8} - \frac{7}{8} = -\frac{2}{8} = -\frac{1}{4}$

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

$-\frac{3}{10} + \frac{7}{10} = \frac{4}{10} = \frac{2}{5}$

$\frac{1}{2} + \frac{5}{4} = \frac{2}{4} + \frac{5}{4}$

$= \frac{7}{4}$

$\frac{2}{9} + \frac{1}{3} = \frac{2}{9} + \frac{3}{9}$

$= \frac{5}{9}$

$\frac{1}{4} + \frac{2}{16} = \frac{4}{16} + \frac{2}{16}$

$= \frac{6}{16} = \frac{3}{8}$

$\frac{2}{3} - \frac{1}{5} = \frac{10}{15} - \frac{3}{15}$

$= \frac{7}{15}$

$\frac{3}{6} - \frac{5}{4} = \frac{6}{12} - \frac{15}{12}$

$= -\frac{9}{12} = -\frac{3}{4}$

$\frac{1}{2} - \frac{8}{7} = \frac{7}{14} - \frac{16}{14}$

$= -\frac{9}{14}$

$\frac{5}{8} - \frac{7}{5} = \frac{25}{40} - \frac{56}{40}$

$= -\frac{31}{40}$

$-\frac{5}{4} - \frac{1}{9} = -\frac{45}{36} - \frac{4}{36}$

$= -\frac{49}{36}$

$-\frac{3}{10} - \frac{7}{3} = -\frac{9}{30} - \frac{70}{30}$

$= -\frac{79}{30}$

MULTIPLYING & DIVIDING FRACTIONS

Multiply or divide the fractions. Simplify your answer.

$\frac{5}{2} \cdot \frac{1}{2} = \frac{5}{4}$

$\frac{1}{3} \cdot \frac{1}{3} = \frac{1}{9}$

$\frac{1}{4} \cdot \frac{2}{4} = \frac{2}{16} = \frac{1}{8}$

$-\frac{2}{5} \cdot \frac{3}{5} = -\frac{6}{25}$

$\frac{3}{6} \cdot -\frac{5}{6} = -\frac{15}{36}$

$-\frac{1}{4} \cdot -\frac{8}{7} = \frac{8}{28} = \frac{2}{7}$

$4\left(\frac{5}{8}\right) = \frac{20}{8} = \frac{5}{2}$

$-3\left(\frac{2}{3}\right) = -\frac{6}{3} = -2$

$-2\left(\frac{4}{9}\right) = -\frac{8}{9}$

$\frac{1}{2} \div \frac{5}{4} = \frac{1}{2} \cdot \frac{4}{5}$

$= \frac{4}{10} = \frac{2}{5}$

$\frac{2}{9} \div \frac{1}{3} = \frac{2}{9} \cdot \frac{3}{1}$

$= \frac{6}{9} = \frac{2}{3}$

$\frac{1}{4} \div \frac{2}{5} = \frac{1}{4} \cdot \frac{5}{2}$

$= \frac{5}{8}$

$-\frac{2}{3} \div \frac{1}{5} = -\frac{2}{3} \cdot \frac{5}{1}$

$= -\frac{10}{3}$

$\frac{3}{6} \div -\frac{5}{4} = \frac{3}{6} \cdot -\frac{4}{5}$

$= -\frac{12}{30} = -\frac{2}{5}$

$-\frac{1}{2} \div -\frac{8}{7} = -\frac{1}{2} \cdot -\frac{7}{8}$

$= \frac{7}{16}$

ANSWER KEY

COMBINING LIKE TERMS

Combine like terms for each expression.

EXPRESSION	SIMPLIFIED
x + x + 3x + y	5x + y
y + 2y + 5x + x	6x + 3y
5 + z + z + 4z – 6	6z - 1
3x + 4x - 5	7x - 5
5c + 2b – 3c	2b + 2c
x + y + 2x	3x + y
6a – 5b + a	7a – 5b
4 + 3x – 7 – 8x	-5x - 3
3(x + 2) - 4	3x + 2
-5(x – 3) + 7x	2x + 15
5m – 6n – 9m	-4m – 6n
-8a – 9b – 10a + 9b	-18a
2(x + 4) + 5x - 3	7x + 5
-10(2 + x) – 3x	-13x - 20

ANSWER KEY

SOLVING ONE-STEP EQUATIONS

Solve the one-step equations.

$x + 7 = 9$
$-7 \quad -7$
$x = 2$

$5 + x = -3$
$-5 \quad -5$
$x = -8$

$6 = x + 8$
$-8 \quad -8$
$-2 = x$

$x - 9 = 1$
$+9 \quad +9$
$x = 10$

$-5 + x = -2$
$+5 \quad +5$
$x = 3$

$4 = x - 7$
$+7 \quad +7$
$11 = x$

$\frac{5x}{5} = \frac{75}{5}$

$x = 15$

$\frac{-2x}{-2} = \frac{-64}{-2}$

$x = 32$

$\frac{-7.5}{-1.25} = \frac{1.25x}{-1.25}$

$-6 = x$

$(4)\frac{x}{4} = 7\,(4)$

$x = 28$

$(-2) -\frac{x}{2} = 8\,(-2)$

$x = -16$

$(-9)\,-3 = -\frac{x}{9}(-9)$

$27 = x$

$\left(\frac{4}{3}\right)\frac{3}{4}x = 7\left(\frac{4}{3}\right)$

$x = \frac{28}{3}$

$-\left(\frac{2}{1}\right) -\frac{1}{2}x = 8\,-\left(\frac{2}{1}\right)$

$x = -16$

$-\left(\frac{9}{2}\right)\,-5 = -\frac{2}{9}x\,-\left(\frac{9}{2}\right)$

$\frac{45}{2} = x$

SOLVING TWO-STEP EQUATIONS

Solve the two-step equations. Leave your answer as a simplified fraction.

$2x + 7 = 9$
$-7 \quad -7$
$\frac{2x}{2} = \frac{2}{2}$
$x = 1$

$5 + 4x = -3$
$-5 \quad -5$
$\frac{4x}{4} = \frac{-8}{4}$
$x = -2$

$6 = 2x + 8$
$-8 \quad -8$
$\frac{-2}{2} = \frac{2x}{2}$
$-1 = x$

$4x - 9 = 1$
$+9 \quad +9$
$\frac{4x}{4} = \frac{10}{4}$
$x = 2.5$

$-5 + 3x = -2$
$+5 \quad +5$
$\frac{3x}{3} = \frac{3}{3}$
$x = 1$

$4 = -x - 7$
$+7 \quad +7$
$\frac{11}{-1} = \frac{-x}{-1}$
$-11 = x$

$5x + 10 = 75$
$-10 \quad -10$
$\frac{5x}{5} = \frac{65}{5}$
$x = 13$

$-2x + 8 = -64$
$-8 \quad -8$
$\frac{-2x}{-2} = \frac{-72}{-2}$
$x = 36$

$-7.5 = 1.25x + 2.5$
$-2.5 \quad -2.5$
$\frac{-10}{1.25} = \frac{1.25x}{1.25}$
$-8 = x$

$\frac{x}{4} - 6 = 7$
$+6 \quad +6$
$(4)\frac{x}{4} = 13\,(4)$
$x = 52$

$-\frac{x}{2} + 3 = 8$
$-3 \quad -3$
$(-2)-\frac{x}{2} = 5\,(-2)$
$x = -10$

$-3 = 8 - \frac{x}{9}$
$-8 \quad -8$
$(-9)\,-11 = -\frac{x}{9}\,(-9)$
$99 = x$

$\frac{3}{4}x + 5 = 7$
$-5 \quad -5$
$(\frac{4}{3})\frac{3}{4}x = 2\,(\frac{4}{3})$
$x = \frac{8}{3}$

$-\frac{1}{2}x - 4 = 8$
$+4 \quad +4$
$-(\frac{2}{1})-\frac{1}{2}x = 12\,-(\frac{2}{1})$
$x = -24$

$-5 = -\frac{2}{9}x + 2$
$-2 \quad -2$
$-(\frac{9}{2})\,-7 = -\frac{2}{9}x\,-(\frac{9}{2})$
$31.5 = x$

ANSWER KEY

RATIOS

Create the ratios for each situation.

To create a perfect fruit smoothie for you and your friends, you must use 5 strawberries, 9 blueberries, 1 banana, 4 slices of pineapple, and 3 slices of mango.

FRUIT	RATIO
strawberries to blueberries	5:9
strawberries to pineapple	5:4
pineapple to mango	4:3
mango to banana	3:1 or 3
banana to blueberries	1:9
mango to blueberries	3:9 → 1:3
pineapple to berries	4:14 → 2:7
mango to the smoothie	3:22
pineapple to the smoothie	4:22 → 2:11
berries to the smoothie	14:22 → 7:11
berries to non-berries	14:8 → 7:4
smoothie to blueberries	22:9
smoothie to mango	22:3

ANSWER KEY

SOLVING PROPORTIONS

Solve each proportion. Leave your answer as a simplified fraction or decimal.

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

x(6) = 3(4)

6x = 12

x = 2

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

6(4) = 5(x)

24 = 5x

4.8 = x

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

3(x) = 5(6)

3x = 30

x = 10

$\frac{x}{7} = \frac{1}{6}$

x(6) = 7(1)

6x = 7

$x = \frac{7}{6}$

$\frac{6}{x} = \frac{2.5}{2}$

6(2) = x(2.5)

12 = 2.5x

4.8 = x

$\frac{4.5}{3} = \frac{9}{x}$

4.5(x) = 3(9)

4.5x = 27

x = 6

$\frac{x}{3} = \frac{4.2}{10}$

x(10) = 3(4.2)

10x = 12.6

x = 1.26

$\frac{11}{x} = \frac{2.5}{5.5}$

11(5.5) = x(2.5)

60.5 = 2.5x

24.2 = x

$\frac{6}{5} = \frac{12}{x}$

6(x) = 5(12)

6x = 60

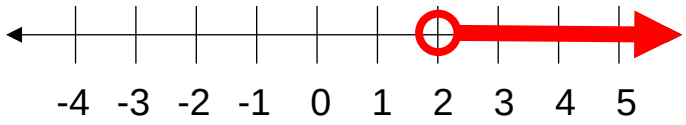
x = 10

ANSWER KEY

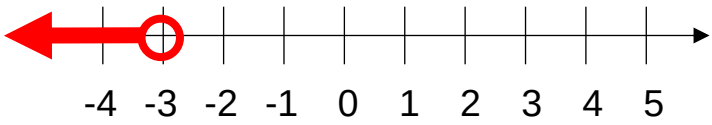
GRAPHING INEQUALITIES

Graph each inequality on the number line shown.

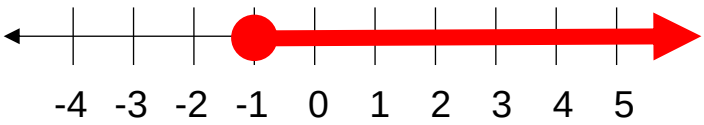
$x > 2$



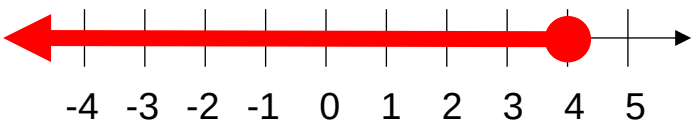
$x < -3$



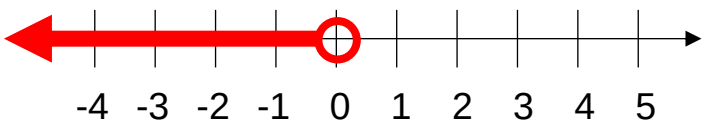
$x \geq -1$



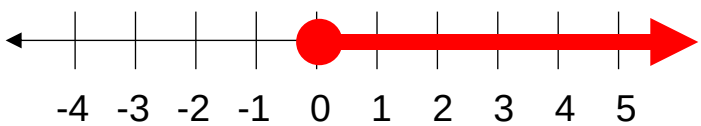
$x \leq 4$



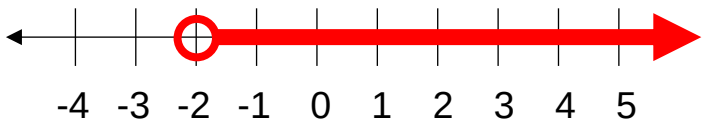
$x < 0$



$x \geq 0$



$x > -2$



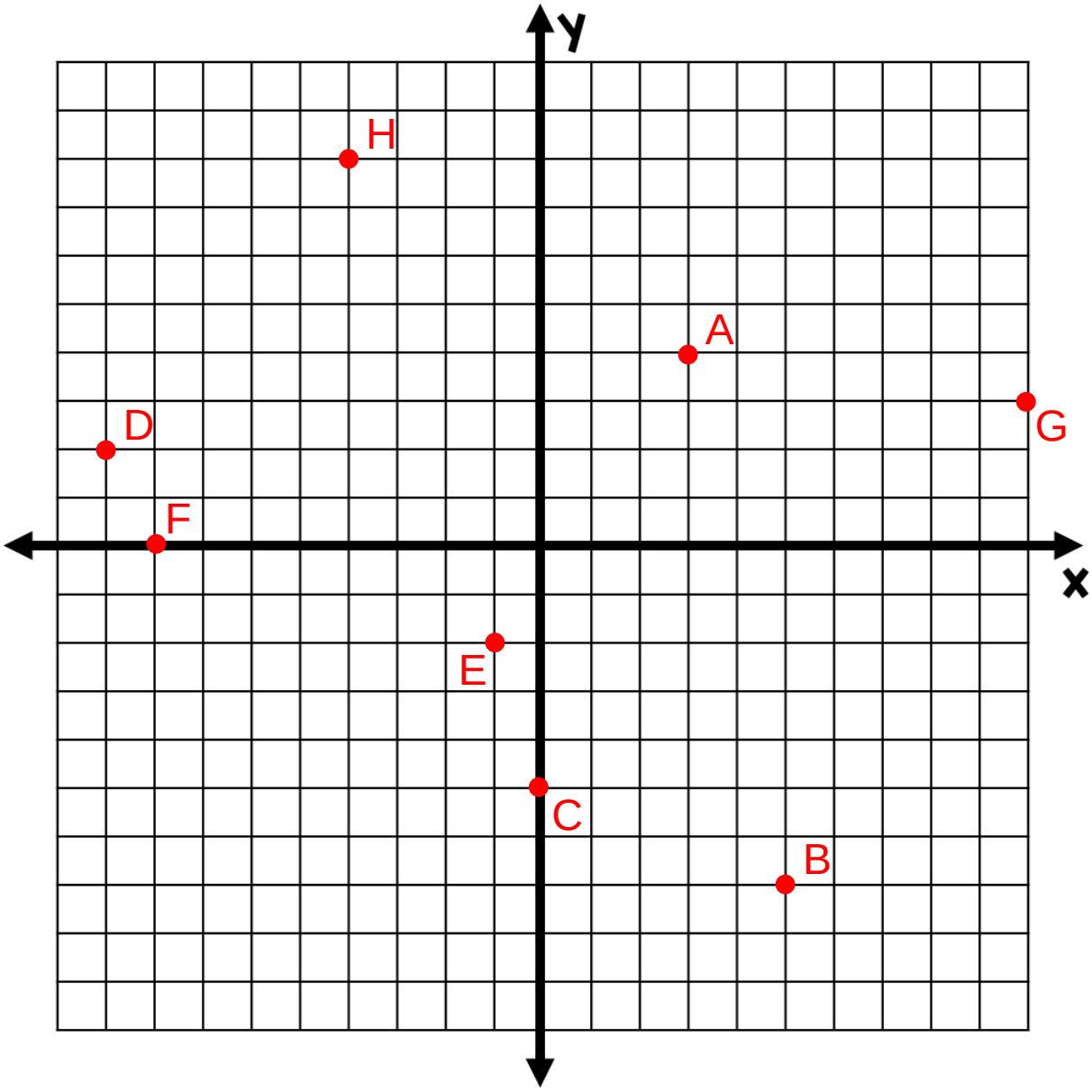
ANSWER KEY

THE COORDINATE PLANE

Plot each point on the coordinate plane and name the quadrant the point is in.

POINT	QUADRANT
A(3, 4)	I
B(5, -7)	IV
C(0, -5)	y-axis
D(-9, 2)	II

POINT	QUADRANT
E(-1, -2)	III
F(-8, 0)	x-axis
G(10, 3)	I
H(-4, 8)	IV

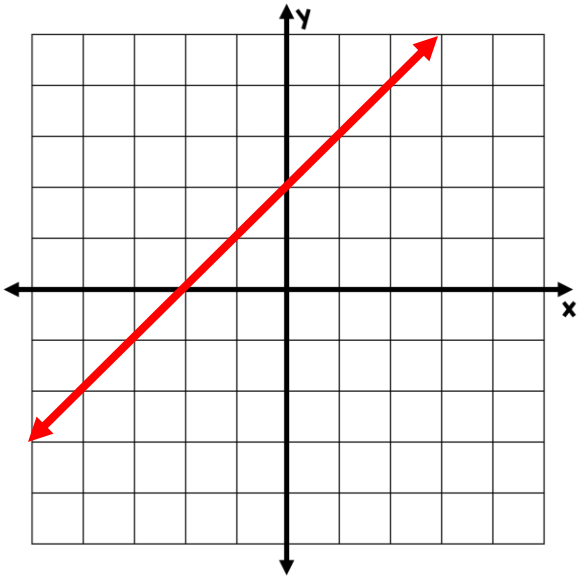


GRAPHING BY MAKING A TABLE

Graph the equations by using substitution to complete a table of values.

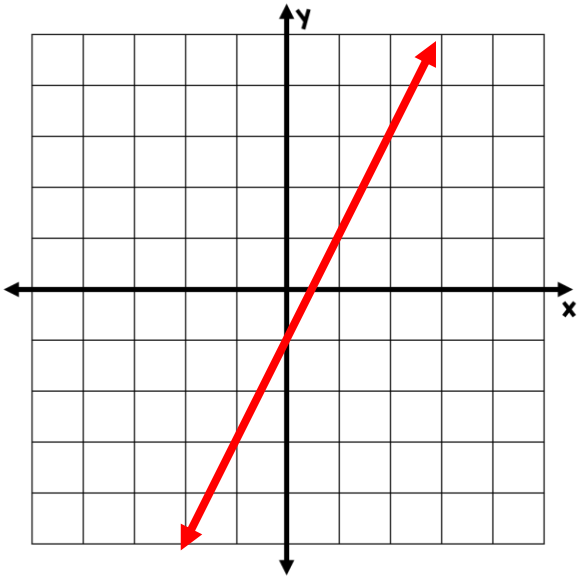
$y = x + 2$

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



$y = 2x - 1$

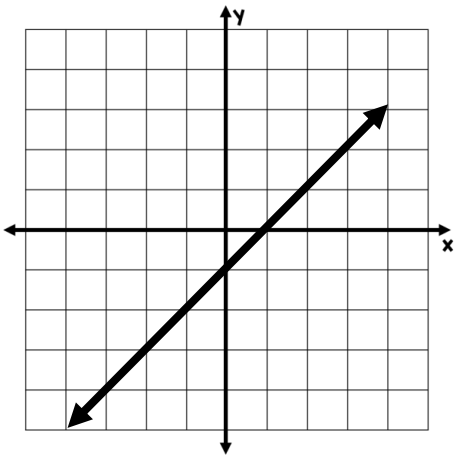
x	y
-2	-5
-1	-3
0	-1
1	1
2	3



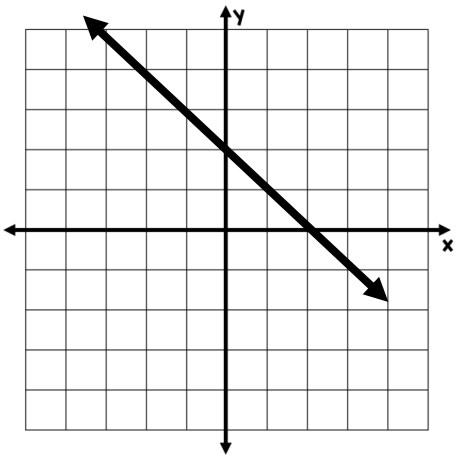
ANSWER KEY

SLOPE & y-INTERCEPT

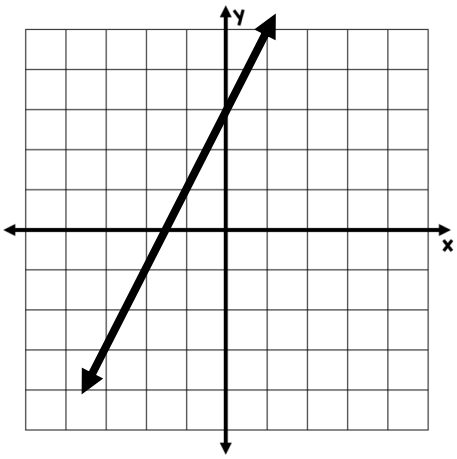
Determine the slope and the y-intercept of each graph.



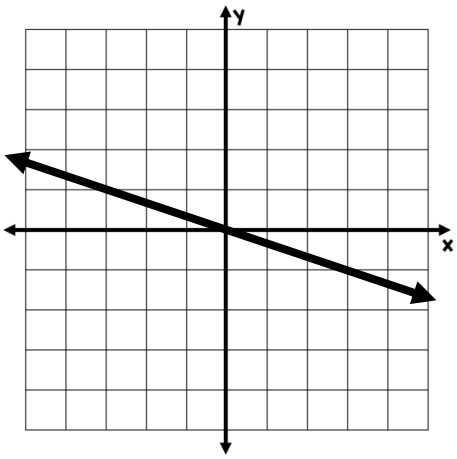
slope:	1
y-intercept:	-1



slope:	-1
y-intercept:	2



slope:	2
y-intercept:	3



slope:	$-\frac{1}{3}$
y-intercept:	0

ANSWER KEY

BASIC EXPONENT RULES

Simplify each expression using exponent rules.

EXPRESSION	SIMPLIFIED
$x \cdot x$	x^2
$y \cdot y \cdot y \cdot y$	y^4
$x \cdot x \cdot y \cdot y \cdot y$	x^2y^3
$y \cdot z \cdot z \cdot z \cdot z \cdot z$	yz^5
$x^2 \cdot x^3$	x^5
$x^5 \cdot x^4$	x^9
$y^6 \cdot y$	y^7
$(x^4)^3$	x^{12}
$(y^3)^2$	y^6
$x^2 \cdot x \cdot y^3 \cdot y^4$	x^3y^7
$a^4 \cdot b^8 \cdot a^5 \cdot b^2$	a^9b^{10}
$c^3 \cdot d \cdot c^4 \cdot b$	bc^7d
$\frac{x^5}{x^2}$	x^3
$\frac{y^8}{y^3}$	y^5

ANSWER KEY

SEQUENCES & PATTERNS

Determine the pattern of each sequence and find the next 3 terms.

2, 4, 8, 16, 32, 64, 128, 256 — multiply by 2

5, 10, 15, 20, 25, 30, 35, 40 — add by 5

-5, -3, -1, 1, 3, 5, 7, 9 — add by 2

0.4, 0.2, 0, -0.2, -0.4, -0.6, -0.8, -1 — subtract by 0.2

3, -6, 12, -24, 48, -96, 192, -384 — multiply by -2

$\frac{3}{9}, \frac{4}{9}, \frac{5}{9}, \frac{6}{9}, \frac{7}{9}$, $\frac{8}{9}$, 1, $\frac{10}{9}$ — add by $\frac{1}{9}$

$\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \frac{1}{32}$, $\frac{1}{64}$, $\frac{1}{128}$, $\frac{1}{256}$ — multiply by $\frac{1}{2}$

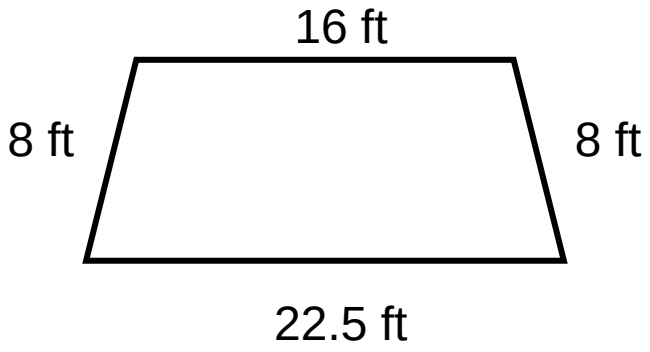
6, -3, -12, -21, -30, -39, -48, -57 — subtract by 9

0.32, 0.8, 2, 5, 12.5, 31.25, 78.125, 195.3125 — multiply by 2.5

ANSWER KEY

CALCULATING PERIMETER

Determine the perimeter of each figure.

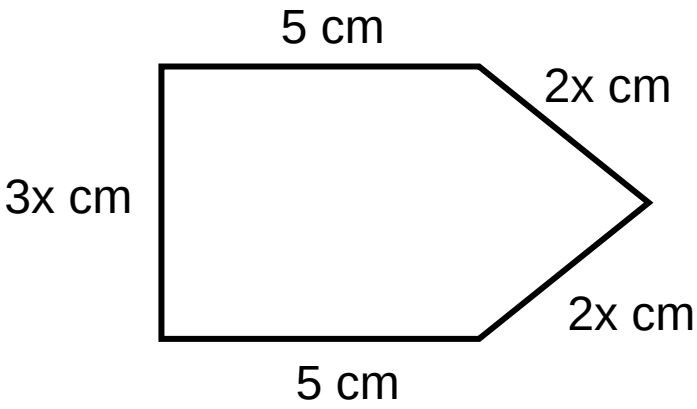


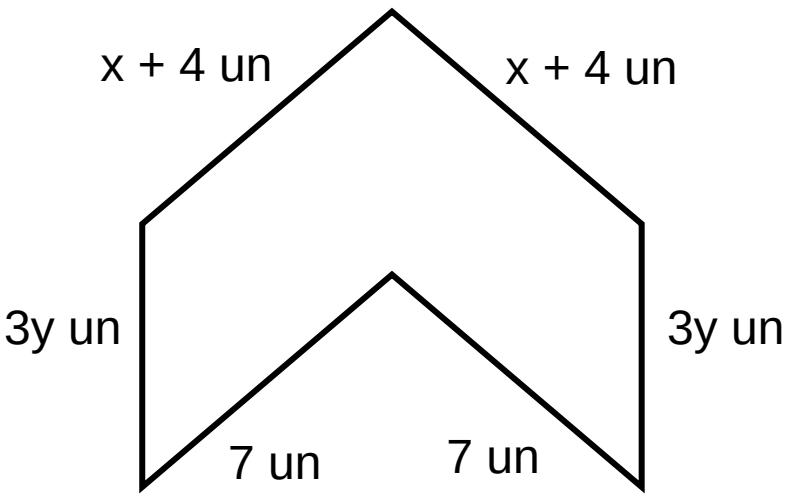
P = 16 + 8 + 22.5 + 8

P = 54.5 ft

P = 5 + 2x + 2x + 5 + 3x

P = 7x + 10 cm





P = x + 4 + x + 4 + 3y + 3y + 7 + 7

P = 2x + 6y + 22 un

ANSWER KEY

CALCULATING AREA

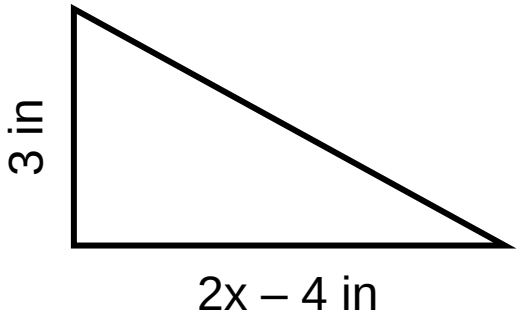
Determine the area of each figure.



A = length • width

A = (x + 3)2

A = 2x + 6 cm^2



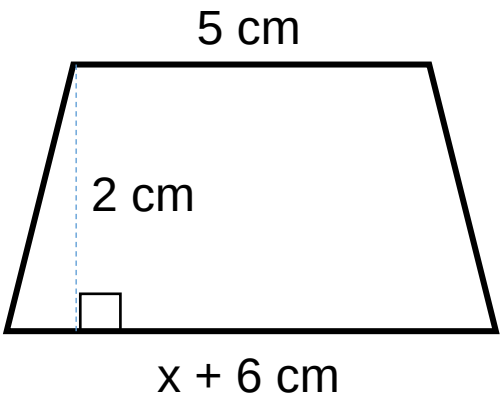
A = $\frac{1}{2}$ base • height

A = $\frac{1}{2}$(2x – 4)(3)

A = $\frac{1}{2}$(2x – 4)(3)

A = 1.5(2x – 4)

A = 3x – 6 in^2



A = $\frac{1}{2}$ height(base 1 + base 2)

A = $\frac{1}{2}$(2)(5 + x + 6)

A = 5 + x + 6

A = x + 11 cm^2

ANSWER KEY

PERFECT SQUARE NUMBERS

Complete the perfect squares chart. Fill in as many as you can without a calculator.

$1^2 =$	1	$16^2 =$	256
$2^2 =$	4	$17^2 =$	289
$3^2 =$	9	$18^2 =$	324
$4^2 =$	16	$19^2 =$	361
$5^2 =$	25	$20^2 =$	400
$6^2 =$	36	$21^2 =$	441
$7^2 =$	49	$22^2 =$	484
$8^2 =$	64	$23^2 =$	529
$9^2 =$	81	$24^2 =$	576
$10^2 =$	100	$25^2 =$	625
$11^2 =$	121	$30^2 =$	900
$12^2 =$	144	$40^2 =$	1600
$13^2 =$	169	$50^2 =$	2500
$14^2 =$	196	$60^2 =$	3600
$15^2 =$	225	$70^2 =$	4900