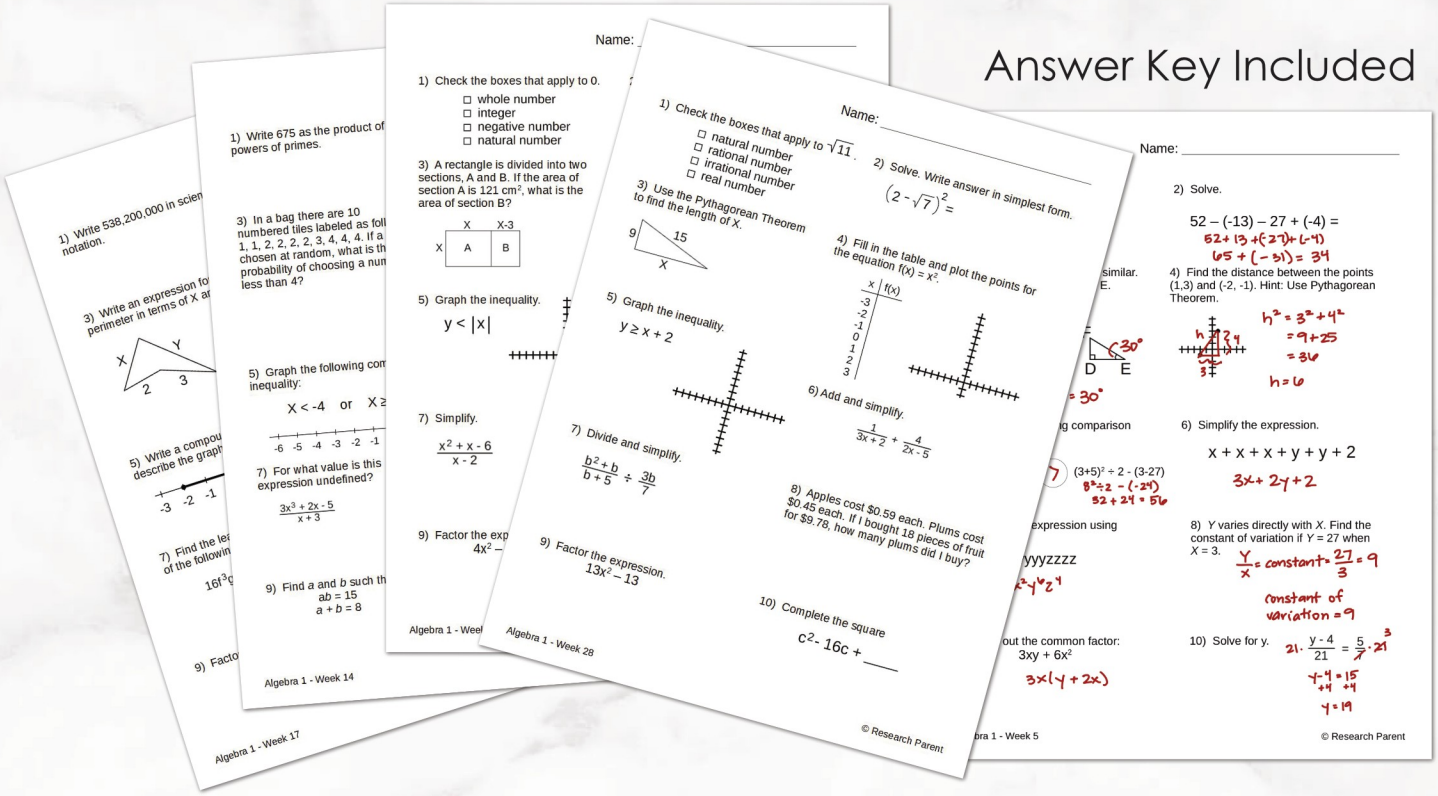
MINIMALIST MATH

Algebra 1 Curriculum



Answer Key Included

36 Week Curriculum

10 problems per week

Topics Covered:

- Understanding Numbers
- Calculations
- Word Problems - Review
- Graphs, Charts, & Tables
- Inequalities
- Algebra Addition & Subtraction
- Algebra Multiplication & Division
- Word Problems - Algebra
- Factoring Algebraic Expressions
- Solving Algebraic Equations

© Research Parent

Table of Contents

Note from Author..... 3

Algebra 1 Curriculum..... 4

Answer Key..... 40

Stay Connected..... 41

Terms of Use..... 41

About the Author..... 42

Patreon Perks..... 42

© Research Parent

Dear fellow educator,

It is easy for kids to feel overwhelmed by math. Most traditional curricula involve a vast amount of work. However, the concepts that kids are required to know by the end of the year can be summarized fairly succinctly. This curriculum takes out all of the repetition, while keeping the full breadth and range of difficulty of problem types seen at this grade level. This allows students to focus on those concepts and see the big picture.

Whether you are using this curriculum as a full homeschool curriculum, to accelerate student progress, to identify weaknesses, or as a summer review, I hope it is helpful to you!

If you would like an answer key to go along with this curriculum, all of my curriculum and answer keys for Grade 1 through Algebra 1, plus task cards and mastery checklists are included in my **$5 Patreon membership**. Instead, you could also purchase this grade level individually on **Etsy**.

Warmly,
Michelle Scharfe, Ph.D. of **ResearchParent.com**

P.S. As someone who is interested in education, you might enjoy this **free curated library** I am creating full of learning resources for kids of all ages! 😄

© Research Parent

Name: _____

1) Order the numbers from least to greatest.

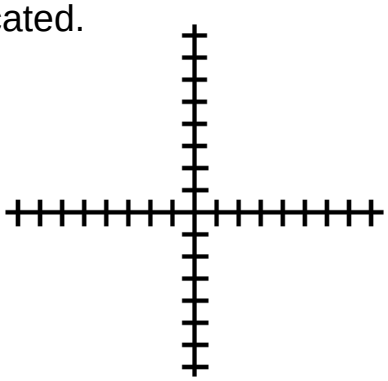
$$0.5, \frac{1}{5}, -5, -0.5$$

2) Solve.

$$5 + 24 \div 3 \times 2 =$$

3) The temperature was -15 °F one morning. By the afternoon, it had risen 28 °F. What temperature was it in the afternoon?

4) Graph the ordered pair (5, -2) on the coordinate plane and specify in which quadrant it is located.



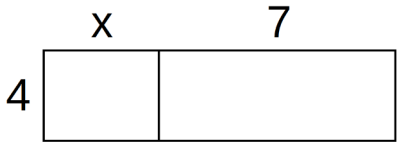
5) Fill in the missing comparison symbol.

$$4.2 - 6.3 \quad \bigcirc \quad -8.5 + 6.6$$

6) Identify the terms in the expression.

$$\frac{14a}{2 + b} + b - 3ac + \frac{c}{5}$$

7) Write the total area of this rectangle in two different ways.



8) Write an algebraic expression for the product of *y* and 7 less than *x*.

9) Find the prime factorization of $120x^2yz^3$.

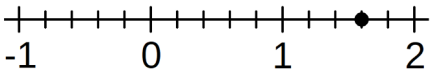
10) Solve for z.

$$3z - 21 = 0$$

© Research Parent

Name: _____

1) Write the coordinate as a fraction.

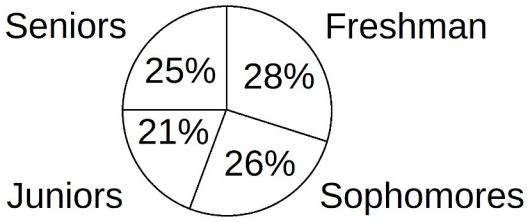


2) Solve.

$$\frac{170 - 146}{(3+1) \times 2} =$$

3) Today I ran 8 miles. How far was that in kilometers?
(Hint: 1 mile = 1.61 km)

4) If the total number of students is 800, how many are freshman?



5) Fill in the missing comparison symbol.

$$\frac{9}{11} \bigcirc \frac{7}{8}$$

6) Identify the factors, variable, and coefficient in the expression.

$$\frac{x}{3}$$

factors:

variable:

coefficient:

7) Write this expression using powers.

$$y \cdot y \cdot y \cdot y$$

8) Write an algebraic expression for 5 more than the quotient of 7 divided by *m*.

9) Find the greatest common factor of $12a^2b$ and $36ab^3$.

10) Solve for x. $\frac{3x}{4} = \frac{1}{2}$

© Research Parent

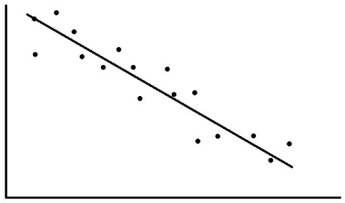
Name: _____

1) Write 62% as a simplified fraction.

2) Evaluate f(x) = 3(x + 2) for x = 7.

3) There are 7 yellow, 2 blue, 8 green, and 3 red marbles in a bag. If a marble is chosen at random, what is the probability that it is yellow?

4) Does the scatter plot indicate a positive or negative correlation?



5) Translate the following sentence into an inequality: the product of a number, x, and 5 is greater than 7.

6) Identify the coefficients and variables in the expression.

$$3m + 0.7mn - n^2$$

variables:

coefficients:

7) Simplify this expression using powers.

$$x^3 x^6$$

8) Write the algebraic equation described and solve: a number, *z*, squared plus 5 is 21.

9) Find the greatest common factor of $27x^3y^2z^7$ and $18x^2yz^5$.

10) Solve for p.

$$-0.8*p + 3.8 = -0.6$$

© Research Parent

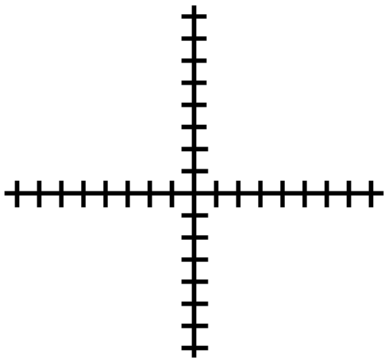
Name: _____

1) Write 31.7% as a decimal.

2) Evaluate $A = \frac{1}{2} bh$ for $b = 7$ and $h = 20$.

3) The ratio of kids to adults at the park was 7:3. If there were 28 kids, how many people were there at the park?

4) Find the midpoint of the line segment with end points at (-7,4) and (5,-2).



5) Fill in the missing comparison symbol.

$27 \div (5-2)^2 \quad \bigcirc \quad 7 - (3-1)^2 \cdot 2$

6) Identify the variables and constant in the expression.

$7a^3 + 15 - 3b^2$

variables:

constant:

7) Simplify this expression using powers.

$(m^3)^7$

8) The sum of 3 consecutive numbers is 414. What are the 3 numbers?

9) Simplify by pulling out the common factor: $6x + 3y - 9z$

10) Solve for c.

$4c + 3(2c - 7) = 9$

© Research Parent

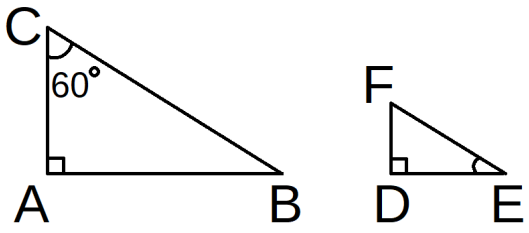
Name: _____

1) Write $\frac{4}{5}$ as a percent.

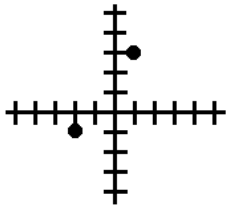
2) Solve.

$$52 - (-13) - 27 + (-4) =$$

3) The triangles below are similar. Find the measure of angle E.



4) Find the distance between the points (1,3) and (-2, -1). Hint: Use Pythagorean Theorem.



5) Fill in the missing comparison symbol.

$7 + (4+1)^2 \cdot 2$ ◯ $(3+5)^2 \div 2 - (3-27)$

6) Simplify the expression.

$$x + x + x + y + y + 2$$

7) Write this expression using powers.

$5xxyyyyyyzzzz$

8) *Y* varies directly with *X*. Find the constant of variation if *Y* = 27 when *X* = 3.

9) Pull out the common factor:

$3xy + 6x^2$

10) Solve for y. $\frac{y - 4}{21} = \frac{5}{7}$

© Research Parent

Name: _____

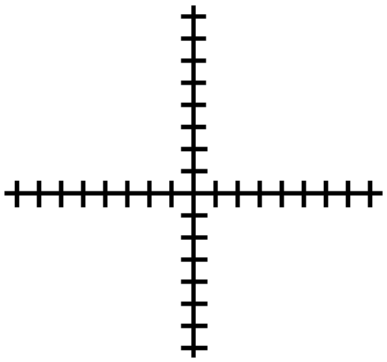
1) Write 0.081 as a percent.

2) Solve and simplify.

$$\frac{4}{7} \times \frac{35}{8} =$$

3) A tree casts a shadow that is 31.5 feet long. A 6 foot tall man casts a shadow that is 4.2 feet. Assuming the shadows form similar triangles, how tall is the tree?

4) Graph the equations y = 5 and x =3. What is the coordinate of the intersection?



5) Translate the following sentence into an inequality: the product of a number, m, and three eighths is less than or equal to nine.

6) Simplify the expression.

$$3 + 11x - 3x + 2 - 5x$$

7) Simplify this expression.

$$\frac{x^7}{x^2}$$

8) *Y* varies inversely as *X*. When *Y* = 14, *X* = 5. Find *X* when *Y* = 7.

9) Simplify by factoring out the common factor:

$$35m^2n^2 + 21mn^3$$

10) Solve for b. $\frac{b}{2} - \frac{b}{3} + \frac{1}{10} = \frac{3}{5}$

© Research Parent

Name: _____

1) Find the absolute value.

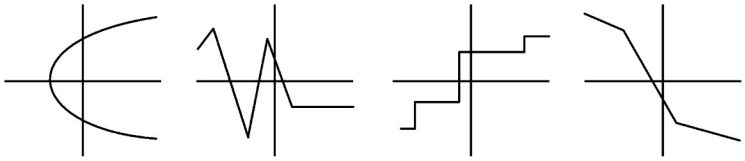
$$|17-20|$$

2) Solve.

$$\frac{5}{6} \div \frac{15}{42} =$$

3) 326 tickets for a charity event were sold for $17 each. If 25% was given to charity, how much did the charity receive?

4) Which graphs do NOT represent a function? (May be more than one.)



5) Fill in the missing comparison symbol.

$$\left|\sqrt{25}\right| + \left|\sqrt{64}\right| \bigcirc \left|\sqrt{81}\right| + \left|\sqrt{9}\right|$$

6) Simplify the expression.

$$\frac{x}{3} + \frac{x}{5} + \frac{2}{7}$$

7) Simplify this expression.

$$c^6 c^{-5}$$

8) Each keychain requires 15 beads. Write an expression for the number of beads needed to make *N* keychains.

9) Factor the following expression: $18x^{11}y^3 - 6x^5y^7$

10) Solve for a. $a^2 - 49 = 0$

© Research Parent

Name: _____

1) In the expression y^4, what is the 4 called? What is the y called? Evaluate for y = 10.

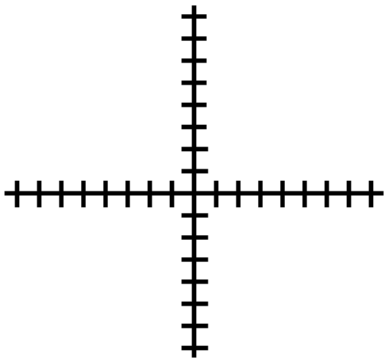
2) Solve.

$$-5 \times \frac{-3}{2} \times \frac{-1}{15} \div \frac{1}{8} =$$

3) A 6-sided die is labeled with the numbers 1, 2, 3, 4, 5, & 6. What is the probability that a number less than 3 will be rolled?

4) Graph the function, y = -2x+5. Is it linear or non-linear?

x	y



5) Fill in the missing comparison symbol for x = 4 and y = 6.

$x^2 + y$ ◯ $y^2 - 3x$

6) Simplify the expression.

$$18\left(\frac{1}{6} + \frac{1}{3}y\right)$$

7) Simplify this expression.

$$x^3y^8 \cdot xy^3$$

8) I have already saved $20 and I save an additional $15 each week. Write an expression for how much money I will have after *n* weeks?

9) Factor the following expression:

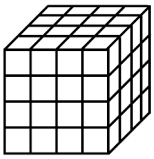
$$3xy^2 - 5x^2y^3 + 2x^2y - 9x^5y^2$$

10) Solve for n. $\frac{7}{n+3} = \frac{5}{n+4}$

© Research Parent

Name: _____

1) Write a power to represent the number of cubes and solve.



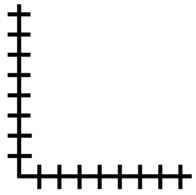
2) Solve.

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

3) I saved some money, but gave my friend $7.50 which was 12% of what I had. How much money do I have now?

4) Graph f(x) = x and g(x) = x + 2. Compare f(x) and g(x) in words.

x	f(x)	g(x)
0		
1		
2		
3		



5) Translate the following sentence into an inequality: 11,305 is greater than the quotient 57 divided by a number, z.

6) Simplify the expression.

$$\frac{1}{4}(16x - 28) + \frac{1}{3}(24 - 21x)$$

7) Simplify this expression.

$$(-7m^7n^3)^2$$

8) If I started with 40 blueberries and I eat 3 blueberries per minute, write an expression for how many blueberries I will have after *M* minutes.

9) Factorize by finding the common grouping.

$$y^3(x - 5) + 7(x - 5)$$

10) Solve for x. $\sqrt{x + 5} = 9$

© Research Parent

Name: _____

1) Is 64 a perfect square? Why or why not?

2) Solve.

$$(-0.3)^5 =$$

3) I bought a guitar for $120 and want to decorate it and sell it for 40% profit. How much should I sell it for?

4) Find the coordinates of the x and y intercepts of the equation: $y = \frac{1}{5}x - \frac{3}{5}$

5) Write the inequality in words:

$$5 \leq 7y$$

6) Simplify the expression.

$$3x + 5y + (-4x) - 2 - y + 17$$

7) Simplify this expression.

$$(3rs^2)^{-3}$$

8) The formula for force, *F*, in terms of mass, *m*, and acceleration, *a*, is *F = ma*. Solve for the mass in terms of *F* and *a*. What is the mass if a 70 kg*m/s^2 force produces 10 m/s^2 of acceleration?

9) Factor the expression.

$$ab - 7a + 4b - 28$$

10) Solve for b. $\frac{|b - 1|}{3} - 7 = 5$

© Research Parent

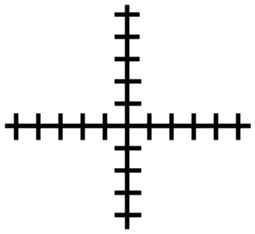
Name: _____

1) Use a factor tree to find the prime factorization of 56.

2) Evaluate $V = \frac{4}{3}\pi r^3$ for r = 6. Express answer in terms of π.

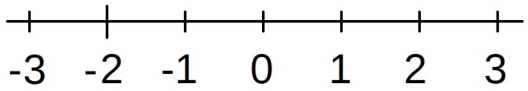
3) At the store, you can buy 3 lbs of apples for $4.35 or 5 lbs of apples for $7.30. Which is a better deal?

4) Determine the slope of the line that intersects (-3, -2) and (1, 4).



5) Graph the inequality on the number line:

$$X \geq -2$$



6) Simplify the expression.

$$\frac{3m}{n^2} + \frac{2}{mn} \cdot \frac{m^2}{n}$$

7) Simplify this expression.

$$(81x^4y)^{\frac{1}{2}}$$

8) The formula for temperature in Fahrenheit, *F*, in terms of Celsius, *C*, is:

$$F = \frac{9}{5}C + 32$$

Find the Celsius temperature when the Fahrenheit temperature is 68 degrees.

9) Factor the expression.

$$y^2 - 5x - 5y + xy$$

10) Solve for x.

$$5\left|\frac{x}{3} - 4\right| = 25$$

© Research Parent

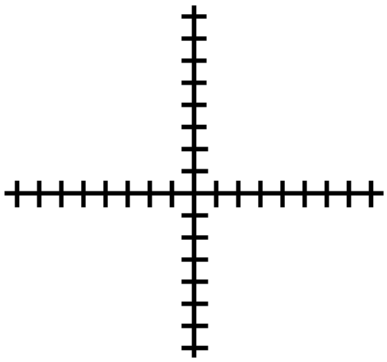
Name: _____

1) List all the factors of 48.

2) Evaluate $(qr)^2 + qrs$ for q = -2, r = 3, and s = 4.

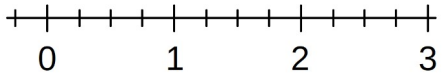
3) A square patio has an area of 144 ft^2. What is the perimeter?

4) Determine the slope of the line that intersects (3, 7) and (-1, -5).



5) Graph the inequality on the number line:

$$x < 1\frac{3}{4}$$



6) Simplify the expression.

$$5k^2 + 3k + 2 - k - 8k^2 + 1$$

7) Simplify this expression.

$$\frac{27a^6b^7c^{12}}{-45a^2b^5c^{16}}$$

8) The vertical height of a ball, h, is given by:

$$h = V_o t + 5t^2$$

Solve for the initial velocity, V_O, in terms of the time, t, and height. What initial velocity is needed to reach a height of 30 meters after t = 2 seconds?

9) Factor the expression.

$$3x^2 + 4x + 15xy + 20y$$

10) Tell whether the ordered pair (3, 7) is a solution of this system.

$$x + 2y = 17$$
$$x - y = -4$$

© Research Parent

Name: _____

1) Is 4 a factor of 1772?

2) Given $f(x) = 5x^2 - 3x$, find $f(-4)$.

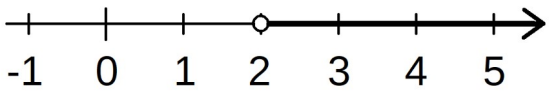
3) I am building a patio 8.5 feet by 12 feet. I will use square tiles that are 6 inches on each side. If I buy 400 tiles, will I have enough to cover the patio?

4) What is the slope of a horizontal line and vertical line?

horizontal:

vertical:

5) Write an inequality to describe the graph below.



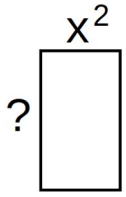
6) Expand the expression.

$$-xy^2\left(\frac{2x}{y} + 5y^2\right)$$

7) Simplify this expression.

$$42x^3y \div 6xy$$

8) The area of the rectangle is $7x^3$. Find the missing dimension.



9) Factor the expression.

$$z^3 + 3 + z^2 + 3z$$

10) What is the solution to this system of equations?

$$y = 4x - 2$$
$$y = x + 1$$

© Research Parent

Name: _____

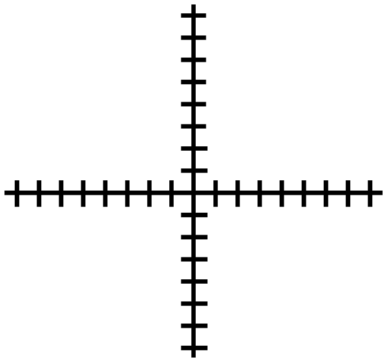
1) Write 675 as the product of powers of primes.

2) Solve.

$$5^{-3} =$$

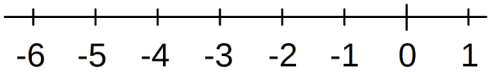
3) In a bag there are 10 numbered tiles labeled as follows: 1, 1, 2, 2, 2, 2, 3, 4, 4, 4. If a tile is chosen at random, what is the probability of choosing a number less than 4?

4) Find the value of y such that the slope of the line between (1,-3) and (4,y) is 3.



5) Graph the following compound inequality:

$$X < -4 \quad \text{or} \quad X \geq -1$$



6) Commute the terms so that the polynomial is in descending order.

$$7a + 5a^5 - 3a^2 + \tfrac{1}{2}a^3 - a^4 + 17$$

7) For what value is this expression undefined?

$$\frac{3x^3 + 2x - 5}{x + 3}$$

8) What multiplication problem and answer is illustrated by this figure?

	$2b^2$	b	3
$6b$	area: $12b^3$	area: $6b^2$	area: $18b$

9) Find *a* and *b* such that:

$$ab = 15$$
$$a + b = 8$$

10) Solve the system of equations for 2 possible values of b.

$$h = b^2 + 5x - 7$$
$$h = 5x + 9$$

© Research Parent

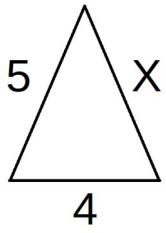
Name: _____

1) What is the least common multiple of 6, 7, and 9?

2) Solve.

$$\left(\frac{3}{4}\right)^{-2} =$$

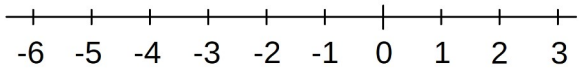
3) If this is an isosceles triangle, what is X?



4) Write the equation for a line in slope-intercept form given a slope of 4 and a y-intercept of -3.

5) Graph the following compound inequality.

$$-4 \leq x < 2$$



6) Write the polynomial in standard form then circle the leading coefficient.

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

7) Simplify this expression.

$$\frac{r^5}{s^7} \times \frac{s^3}{r^8}$$

8) What multiplication problem and solution is illustrated by this table?

	-x	7
2x	$-2x^2$	14x
-5	5x	-35

9) Find *a* and *b* such that:

$ab = 24$

$a + b = -14$

10) Solve the system of equations using the substitution method.

$$x - y = 11$$
$$2x + 3y = 12$$

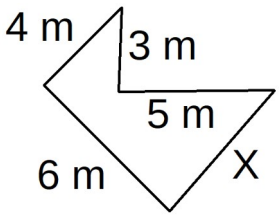
© Research Parent

Name: _____

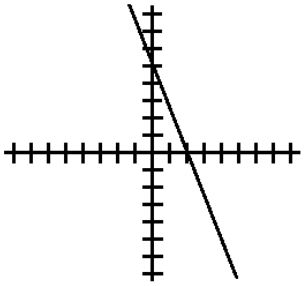
1) Write 0.000038 in scientific notation.

2) Given $f(x) = 5^x$, find f(-1). Write answer as a decimal.

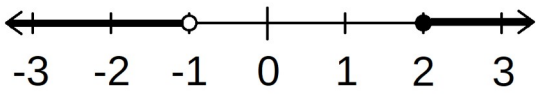
3) If the perimeter of this shape is 25 m, how long is X?



4) Write the equation for this line in slope-intercept form.



5) Write a compound inequality to describe the graph below.



6) Rewrite the polynomial in standard form.

$$7y + 3y^3 - 2y^2 + 4 - y^4$$

7) Simplify this expression.

$$\frac{a^3}{b^5} \times \left(\frac{a^7}{b^2}\right)^{-1}$$

8) Fill in the missing expressions in the table.

	4
$-21x^2$	
	8

9) Find *a* and *b* such that:

$ab = -12$

$a + b = -1$

10) Solve the system of equations using the substitution method.

$x + y = 6$

$3x + 5y = 40$

© Research Parent

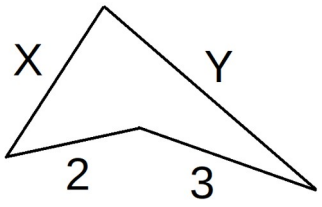
Name: _____

1) Write 538,200,000 in scientific notation.

2) Solve.

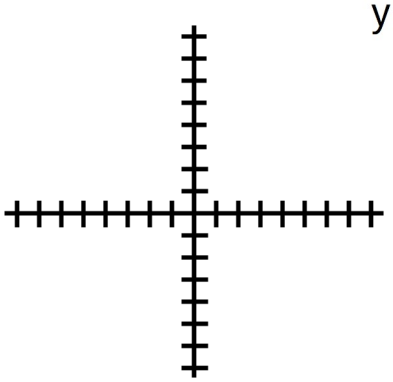
$64^{\frac{2}{3}} =$

3) Write an expression for the perimeter in terms of X and Y.

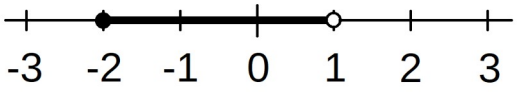


4) Graph the equation using the slope and y-intercept.

$y = \frac{2}{3}x - 5$



5) Write a compound inequality to describe the graph below.



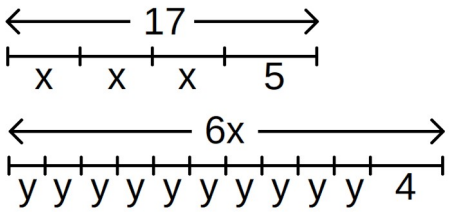
6) This is a polynomial. True or false?

$x^4 - 5$

7) Find the least common multiple of the following two expressions.

$16f^3g^2 \quad 28f^2g^4h$

8) This diagram represents a pair of simultaneous equations. Write the equations, then solve for x and y.



9) Factor the trinomial.

$x^2 + 10x + 21$

10) Solve the system of equations using the elimination method.

$x - y = -1$
$3x + y = 13$

© Research Parent

Name: _____

1) Express 7.62×10^3 in standard form.

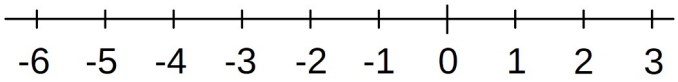
2) Solve.

$$(6.821 \times 10^7)^0 =$$

3) If a coin is flipped 3 times in a row, what is the probability that all 3 times it will land on tails?

4) Find the slope and y-intercept of the line given by $2x + y = -6$.

5) Write a compound inequality that represents all real numbers greater than 2 or less than -4. Graph the solution.



6) This is a polynomial. True or false?

$$x^3 + \frac{7}{x}$$

7) Find the product.

$3m^2(-4x^3 + 3y - 7z)$

8) I am planning a trip to a hotel that costs $99 per day plus a $40 service fee per trip. If I have $450 to spend, how many days can I stay?

9) Factor the trinomial.

$x^2 + 2x - 35$

10) Solve the system of equations using the elimination method.

$-3x + 2y = 15$
$3x - 8y = 3$

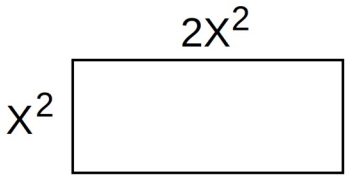
© Research Parent

Name: _____

1) Express 1.98×10^{-4} in standard form.

2) Write $(4.5 \times 10^{5}) \times (5 \times 10^{4})$ in scientific notation.

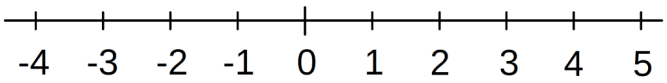
3) What is the perimeter and area of this rectangle in terms of X?



4) Determine the slope and y-intercept of the equation, $3x + 5y = 15$. Write the equation in slope-intercept form.

5) Solve the inequality and graph on a number line:

$$4X - 2 > 16 - 2X$$



6) What is the degree of this monomial?

$$8x^2yz^3$$

7) Expand and simplify the expression.

$$(c + 5)(c - 2)$$

8) I go to the gym every 7 days. My brother goes every 3 days. My friend goes every 4 days. If we are all there today, how many days until we are all there on the same day again?

9) Factor the trinomial:

$$a^2 + 5a - 36$$

10) Solve the system of equations using the elimination method.

$$x + y = 7$$
$$3x - 2y = -34$$

© Research Parent

Name: _____

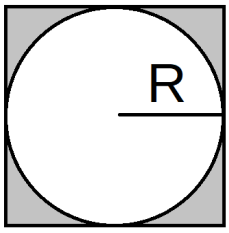
1) Solve the factorial of 6.

$6! =$

2) Solve and express answer in scientific notation.

$$\frac{3.6 \times 10^{3}}{1.2 \times 10^{7}} =$$

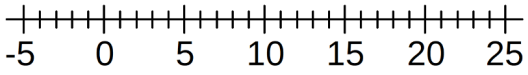
3) The diameter of the circle is equal to the length of the side of the square. Find the area of the shaded region in terms of π and the radius of the circle.



4) Write an equation for a line parallel to $y = 3x + 1$ that has a y-intercept of 4.

5) Solve the inequality and graph on a number line.

$$\frac{x+3}{2} + \frac{x}{3} < 14$$



6) Show that this function is odd.

$$y = 4x^3 - 5x$$

7) Expand and simplify.

$(3m - 2)(m + 7)$

8) A right triangle has a hypotenuse that is 2 cm less than twice the length of the shortest side. The third side is 2 cm less than the hypotenuse. What is the length of the shortest side?

9) Factor the trinomial:

$x^2 - 8x - 48$

10) Fill in the missing term.

$(\square)(2x^2 + 5x - 7) = 6x^3 + 15x^2 - 21x$

© Research Parent

Name: _____

1) Find the mean, median, mode, and range of the dataset.

14, 12, 15, 8, 14, 4, 10, 11, 10, 14, 9

2) Express answer as a power of 10.

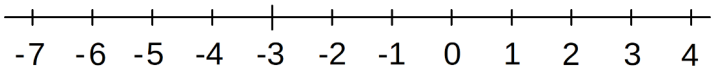
$\sqrt{100{,}000{,}000} =$

3) Two number cubes labeled 1-6 are rolled. What is the probability that the numbers will have a sum of 5 or 6?

4) Write the equation for a line in point-slope form that has a slope of 2 and passes through the point (5, -7).

5) Solve the inequalities and graph on a number line.

$x - 4 < -3$ $\qquad \frac{-x}{5} < 1$



6) Show that this function is even.

$y = 5 + 3x^2 - 4x^4$

7) Expand and simplify.

$(x + 8)(x - 8)$

8) I want to spend $150 on 4 gifts. I already spent $39 on one gift. If I want to spend the same amount on each of the other 3 gifts, how much should I spend per gift?

9) Factor the trinomial:

$x^2 + 6x - 72$

10) Fill in the missing polynomial.

$(-2x)(\square) = -6x^3 + 2x^2 - 4x$

© Research Parent

Name: _____

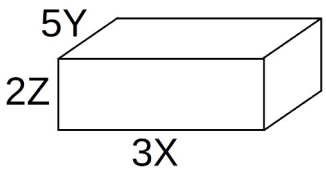
1) Find the domain and range of these coordinates.

(-1,4), (-3, 7), (2,5), (6, -4)

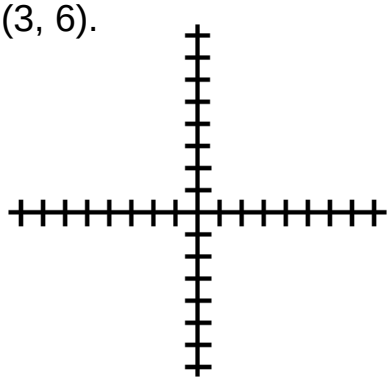
2) Solve.

$\sqrt[3]{343} =$

3) What is the volume of this shape in terms of X, Y, and Z?

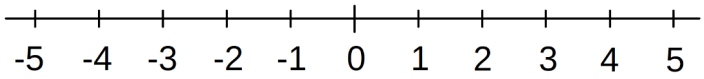


4) Write the equation for a line in point-slope form that passes through the point (4, 2) and (3, 6).



5) Solve the inequalities and graph on a number line.

$7n - 4 \leq -25$ $\frac{n}{2} - 8 > -7$



6) Is this function even, odd, or, neither?

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

7) Expand and simplify.

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

8) One gym charges a $20 sign up fee plus $65 per month. A second gym charges a $140 sign up fee plus $45 per month. After how many months will the total cost have been the same?

9) Factor the trinomial:

$2x^2 + 13x + 15$

10) Find the values of z that satisfy the equation below.

$$(z - 5)(z + 7)(z - 1) = 0$$

© Research Parent

Name: _____

1) What property is illustrated?

$$9 + 5 = 5 + 9$$

2) Solve.

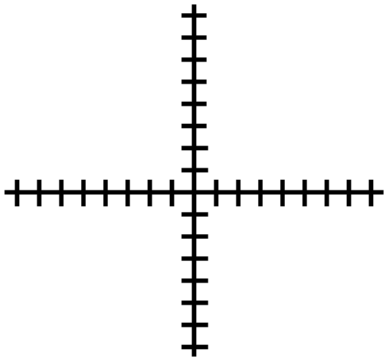
$$2\sqrt{7} \times -5\sqrt{7} =$$

3) The volume of a square pyramid is equal to one third the area of the base, d^2, multiplied by the height, h.

$$V = \frac{1}{3}d^2h$$

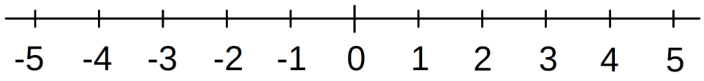
Solve for h in terms of V and d, then find h if V = 21.6 cm^3 and d = 3.6 cm.

4) Write the equation for a line in point-slope form that passes through the point (2,1) and has a slope of -½. Graph the line.



5) Solve the inequalities and graph on a number line.

$$4(x-2) + 2x \leq 16 - 3(3x-2)$$



6) Is this function even, odd, or neither?

$$y = 6 + 3x - 2x^2$$

7) Expand and simplify.

$$(y - 5)(y + 7) + 3y^2 - (y - 2)^2 + 18$$

8) I am 4 years older than my sister. In 12 years, she will be six sevenths my age. How old am I?

9) Factor the trinomial:

$$3x^2 - 7x + 2$$

10) Find the roots of the expression.

$$(x - 9)(x + 3)(x + 4)$$

© Research Parent

Name: _____

1) What property is illustrated?

$$9 \times 5 = 5 \times 9$$

2) Show that:

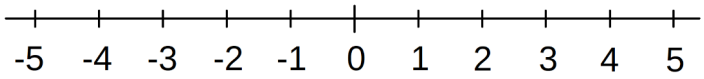
$$\sqrt{\left(\frac{36}{4}\right)} = \frac{\sqrt{36}}{\sqrt{4}}$$

3) A blue, red, and yellow marble are in a bag. If a marble is chosen at random then replaced, what is the probability of 2 consecutive blue draws?

4) Are these lines parallel?

$$y = \frac{3}{5}x + 7$$
$$-3x + 7y = 5$$

5) Solve the compound inequality and graph on a number line. $-3 \leq 2x + 3 < 11$



6) Add and simplify. $\frac{4y^3}{y^2} + \frac{3y^2}{2y}$

7) Expand and simplify.

$$(a^3b^2 + ab^7)(a^5b + b^3)$$

8) A carnival is having a raffle. The first ticket costs $5 and each additional entry costs $3. Write an equation to model this situation for N raffle tickets, then find the total cost of 15 tickets.

9) Determine whether the trinomial is a perfect square. If it is, factor the trinomial.

$$x^2 + 14x + 49$$

10) Solve by factoring.

$$b^2 - b - 6 = 0$$

© Research Parent

Name: _____

1) What property is illustrated?

$$(9 + 5) + 2 = 9 + (5 + 2)$$

2) What is 23% of 72?

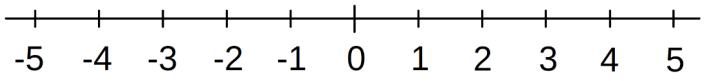
3) A rectangle has a length of X+5 and a width of X-5. What is the perimeter in terms of X? What is the area in terms of X?

4) Are these lines perpendicular?

$$y = 2x + 5$$
$$x + 2y = -3$$

5) Solve the inequality and graph on a number line.

$$|x| > 2$$



6) Subtract and simplify.

$$\frac{4x^2}{4x - 5} - \frac{5x}{4x - 5}$$

7) Expand and simplify.

$$(\sqrt{m} - \sqrt{n})(\sqrt{m} + \sqrt{n})$$

8) I want to buy a bike for $330. I have already saved $54. My job pays $12 per hour. How many hours will I have to work to have enough money to buy the bike?

9) Determine whether the binomial is the difference of two squares. If it is, factor the binomial.

$$16x^2 - 121$$

10) Solve by factoring.

$$m^2 - 14m + 48 = 0$$

© Research Parent

Name: _____

1) What property is illustrated?

$$(9 \times 5) \times 2 = 9 \times (5 \times 2)$$

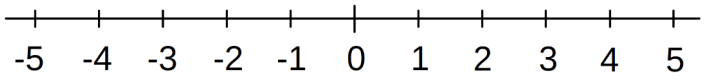
2) 1.044 is 120% of what number?

3) The area of a rectangle is 48 square meters. If the length is 8 m more than the width, what is the length and width?

4) Write the equation in both point-slope form and slope-intercept form of the line with slope 5 that passes through point (1, -7).

5) Solve the inequality and graph on a number line.

$$\left|\frac{x}{6}\right| \leq \frac{1}{3}$$



6) Add and simplify.

$$\frac{x^2}{x+3} + \frac{9x}{3x+9}$$

7) Divide and simplify.

$$\frac{6x^2y}{xz^3} \div \frac{xy^7}{7z^2}$$

8) I had $10.60. I gave my friend some dimes and twice as many quarters and now I have $5.20. How many quarters did I give my friend?

9) Factor this difference of squares.

$$36a^4b^{12} - 81c^8d^2$$

10) Solve for y.

$$y^2 + 5y - 24 = 3y$$

© Research Parent

Name: _____

1) Check the boxes that apply to -5.

- ☐ whole number
- ☐ integer
- ☐ negative number
- ☐ natural number

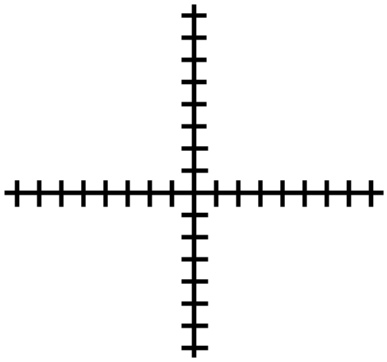
2) Find the full amount if 7% is 28.

3) A bag contains 7 blue marbles and 3 red marbles. Find the probability of drawing a red marble, keeping it, then drawing another red marble.

4) Graph the system of linear equations to find the solution.

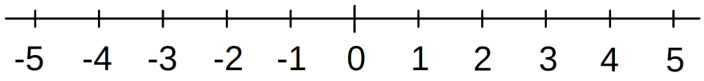
$2x + y = 3$

$x - y = 6$



5) Solve the inequality and graph on a number line.

$|x + 3| - 5 > -4$



6) Subtract and simplify.

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

7) Divide and simplify.

$(21x^5 + 14x^4 - 35x^3) \div 7x^3$

8) The difference between 2 numbers is 17. The larger number is 7 less than 4 times the smaller number. Find the two numbers?

9) Factor this difference of squares.

$m^2 - (r + s)^2$

10) Fill in the blanks to complete the square.

$x^2 + 6x + _____ = (x + __)^2$

© Research Parent

Name: _____

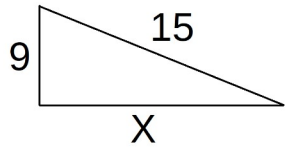
1) Check the boxes that apply to $\sqrt{11}$.

- ☐ natural number
- ☐ rational number
- ☐ irrational number
- ☐ real number

2) Solve. Write answer in simplest form.

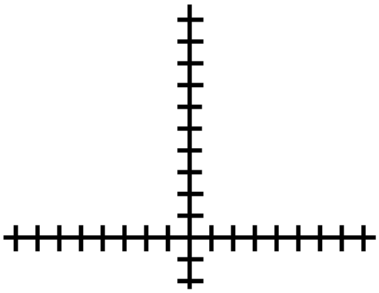
$$\left(2 - \sqrt{7}\right)^2 =$$

3) Use the Pythagorean Theorem to find the length of X.



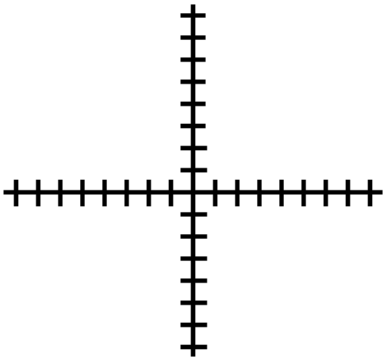
4) Fill in the table and plot the points for the equation $f(x) = x^2$.

x	f(x)
-3	
-2	
-1	
0	
1	
2	
3	



5) Graph the inequality.

$y \geq x + 2$



6) Add and simplify.

$$\frac{1}{3x + 2} + \frac{4}{2x - 5}$$

7) Divide and simplify.

$$\frac{b^2 + b}{b + 5} \div \frac{3b}{7}$$

8) Apples cost $0.59 each. Plums cost $0.45 each. If I bought 18 pieces of fruit for $9.78, how many plums did I buy?

9) Factor the expression.

$13x^2 - 13$

10) Complete the square

$c^2 - 16c + ____$

© Research Parent

Name: _____

1) Check the boxes that apply to π.

- ☐ natural number
- ☐ rational number
- ☐ irrational number
- ☐ real number

2) Solve. Write answer in simplest form.

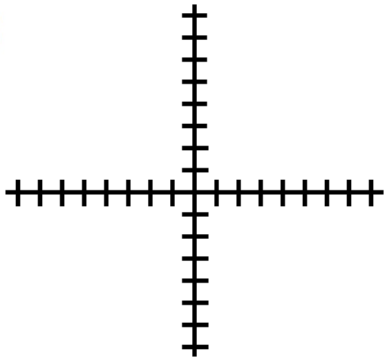
$$\left(2\sqrt{11} + 3\sqrt{7}\right)\left(2\sqrt{11} - 3\sqrt{7}\right) =$$

3) 7 people are in a room. How many different ways could they be arranged in a line?

4) What is the vertex of the parabola $y = 5x^2 - 3$? Does it open upward or downward?

5) Graph the inequality.

$$y < -2x + 3$$



6) Simplify.

$$5\sqrt{ab} - 2\sqrt{9ab}$$

7) Simplify.

$$\frac{(x + 7)(x - 2)}{(2x + 3)} \cdot \frac{4x + 6}{x + 7}$$

8) I am going on a 575 mile trip. If I drive at 65 mph, write a formula for how many miles I have left after *t* hours.

9) Factor the expression.

$$16x^3 - 64x$$

10) Add a constant to both sides to solve the quadratic by completing the square.

$$z^2 + 4z + ___ = 5 + ___$$

© Research Parent

Name: _____

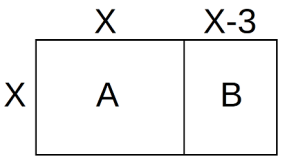
1) Check the boxes that apply to 0.

- ☐ whole number
- ☐ integer
- ☐ negative number
- ☐ natural number

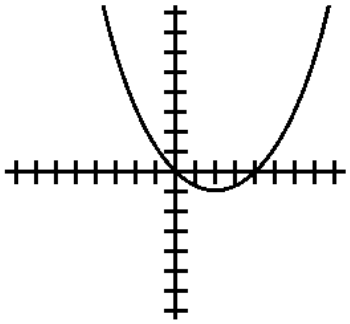
2) Rationalize the denominator.

$$\frac{\sqrt{3} - 4\sqrt{5}}{2\sqrt{3}} =$$

3) A rectangle is divided into two sections, A and B. If the area of section A is 121 cm^2, what is the area of section B?

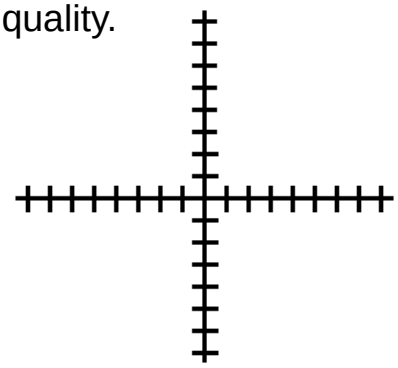


4) Find the domain and range for the following parabola With a vertex at (2, -1).



5) Graph the inequality.

$y < |x|$



6) Simplify.

$$\sqrt{64m^2n^3}$$

7) Simplify.

$$\frac{x^2 + x - 6}{x - 2}$$

8) I am going on a 240 mile round trip. On the way there, I travel at 30 mph. On the way home, I travel at 40 mph. What is my average speed for the whole trip?

9) Factor the expression.

$4x^2 - 25$

10) Solve the equation by completing the square.

$p^2 - 12p = -29$

© Research Parent

Name: _____

1) Check the boxes that apply to $0.\overline{4}$.

- ☐ natural number
- ☐ rational number
- ☐ irrational number
- ☐ real number

2) Solve and rationalize the denominator.

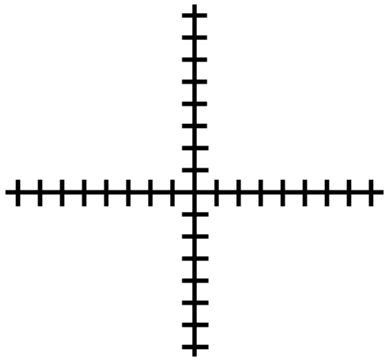
$$\frac{1}{\sqrt{7}} + \frac{1}{\sqrt{3}} =$$

3) I need to weed my garden which is 48 square feet. If I can weed 2 square feet every 5 minutes, how long will it take me in hours?

4) Find the coordinates of the vertex of the graph $y = 2x^2 + 4x + 7$.

5) Sketch the region given by the inequality.

$$x - \frac{1}{2}y \geq 1$$



6) Simplify.

$$y^2\sqrt{5y} + \sqrt{45y^5}$$

7) Simplify.

$$(x^2 - 12x + 35) \div (x - 5)$$

8) I leave the house and walk at 3 miles per hour. After 40 minutes, my brother leaves the house and walks to catch up to me at 3.5 miles per hour. How long will it take him to catch up to me?

9) Factor the expression.

$$x^2 + 24x + 144$$

10) Write the quadratic formula used to solve the equation:

$$ax^2 + bx + c = 0$$

© Research Parent

Name: _____

1) Check the boxes that apply to $\sqrt{-7}$

- ☐ natural number
- ☐ rational number
- ☐ irrational number
- ☐ real number

2) Rationalize the denominator.

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

3) Distance, d, is related to velocity, v, and time, t, using the formula:

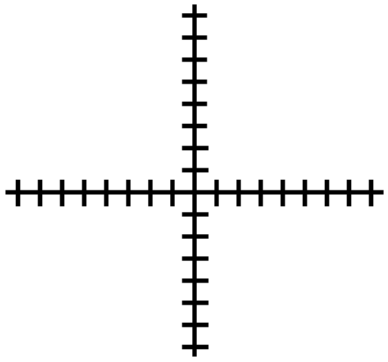
$$d = v \cdot t$$

If an object is traveling at v = 16 m/s, how long will it take to reach a distance of d = 56 m?

4) What is the axis of symmetry of the quadratic function $y = -x^2 + 6x - 7$.

5) Sketch the region given by the inequality.

$x + 2y < 10$



6) Simplify.

$$\frac{1}{(z+1)(z+2)} + \frac{1}{(z+1)(z+3)} + \frac{1}{(z+2)(z+3)}$$

7) Simplify.

$$\frac{x^2 - 6x - 16}{x^2 - 64}$$

8) Three cubic meters of soil that is 25% sand is mixed into 7 m^3 of soil that is 35% sand. What is the sand content of the new mixture?

9) Factor the expression.

$$27y^7 - 48y^5$$

10) Give the values of a, b, and c to use in the quadratic formula, then solve for x.

$4x^2 + 3x - 1 = 0$

a =
b =
c =

© Research Parent

Name: _____

1) The formula for an arithmetic sequence is: $a_n = a_1 + (n-1) \cdot d$

Find the first 4 terms when:

$$a_1 = 7, \ d = 3$$

2) Solve and rationalize the denominator.

$$\frac{1}{\sqrt{7}+\sqrt{5}} + \frac{1}{\sqrt{7}-\sqrt{5}} =$$

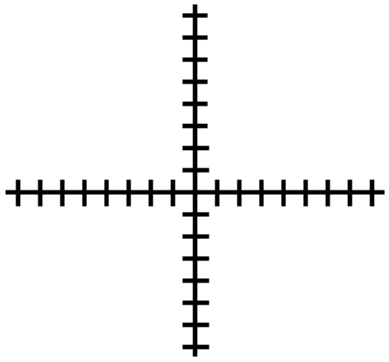
3) In the last 7 soccer games, I scored 3, 7, 0, 3, 5, 1, and 2 goals. Find the mean, median, mode, and range of this set of numbers.

4) Identify the asymptotes for the equation:

$$y = \frac{2}{x - 3} - 5$$

5) Sketch the region that satisfies both inequalities.

$y \geq x \qquad y \leq 3$



6) Simplify. $\frac{2}{x+3} - \frac{3x+7}{x^2+5x+6}$

7) Clear the radicals from the denominator.

$$\frac{\sqrt{31x^5}}{\sqrt{7x^3}}$$

8) I can make 3 clay pots every 2 hours. Write a formula for how many clay pots I can make in N hours. How long would it take me to make 27 pots?

9) Factor the expression.

$60x^2yz - 24x^2z + 105x^2y - 42x^2$

10) Use the discriminant, $b^2 - 4ac$, to find the number of real solutions, then find the solutions.

$$x^2 - 5x + 3 = 0$$

© Research Parent

Name: _____

1) Write the equation for the following arithmetic sequence:

5, 3, 1, -1

2) Find g(f(2)) and f(g(2)) given:

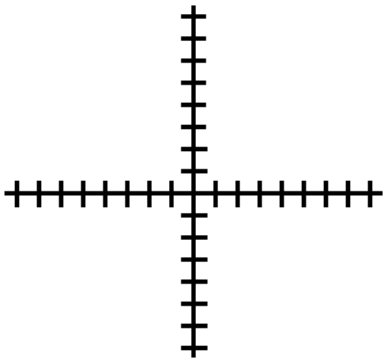
$f(x) = 3x - 2$

$g(x) = x^3$

3) A restaurant has 5 different desserts to choose from. How many different combinations of 2 different desserts can I choose?

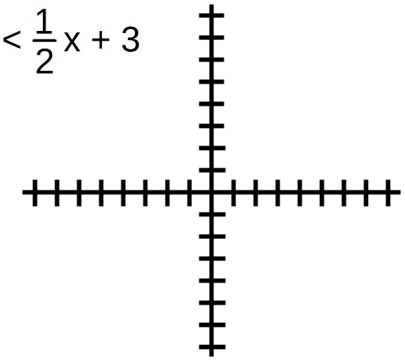
4) Graph the function $f(x) = |x - 1| - 2$ and give the coordinates of the vertex.

x	f(x)



5) Sketch the region that satisfies both inequalities.

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



6) Simplify.

$$\frac{5x}{x^2 - x - 12} - \frac{3}{x - 4}$$

7) Clear the radicals from the denominator.

$$\frac{1}{\sqrt{x} - \sqrt{y}}$$

8) It takes me 3 hours to paint a fence alone. It takes my friend 2 hours. How long will it take if we do it together?

9) Factor the expression.

$3s^3t^4 - s^2t^4 - 15s^3t^3 + 5s^2t^3$

10) Use the discriminant to find the number of real solutions, then solve for x.

$4x^2 - 4x + 1 = 0$

© Research Parent

Name: _____

1) The formula for a geometric sequence is: $a_n = a_1 r^{(n-1)}$

Find the first 4 terms when:

$a_1 = 3,\ r = 4$

2) Find f(a+b) if $a \geq 3$ and $b \geq 2$, given:

$$f(x) = \begin{cases} 5x + 1 & \text{for } x < -1 \\ 2x & \text{for } -1 \leq x < 5 \\ x^4 & \text{for } x \geq 5 \end{cases}$$

3) A 3 digit code is created choosing from 10 possible numbers (0-9) for each digit. If no digit is repeated, how many different 3 digit codes are possible?

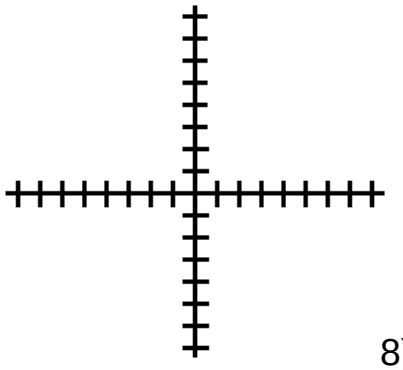
4) The stem and leaf plot shows height in inches of a group of kids. Find the mean, mode, median, and range.

stem	leaves
4	8 9
5	2 5 5 7 8
6	1 5 8
7	0

5) Sketch the region that satisfies both inequalities.

$x - 3y < 0$

$-3x + y \geq 0$



6) Simplify. $\dfrac{3x - 9}{x^2 - 9} + \dfrac{x}{x + 3}$

7) Simplify.

$$\frac{y^2 - 9}{(y + 5)^2} \cdot \frac{y^2 - 3y - 40}{y^2 - 5y + 6}$$

8) I can plant a garden in 10 hours alone. If my brother helps, it will take us 6 hours to do it together. How long would it take my brother alone?

9) Factor the expression.

$3x^3 - 18x^2 - 48x$

10) Use the discriminant to find the number of real solutions, then solve for x.

$3a^2 - 2a + 1 = 0$

© Research Parent

Name: _____

1) Write an equation for the following geometric sequence:

7, 21, 63, 189

2) Write $0.\overline{8}$ as a fraction.

Tip: Let x = $0.\overline{8}$ and calculate 10x – x.

3) There are 2 green and 3 black marbles in a bag. If I choose 2 at the same time, what is the probability that one will be green and one will be black?

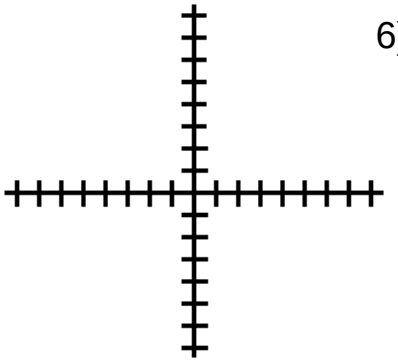
4) Make a box and whiskers plot using the following data of kids' ages:

7, 16, 9, 12, 7, 14, 11, 8,
15, 12, 10, 17, 13, 16, 8

5) Sketch the region that satisfies both inequalities.

$y \geq \frac{3}{2}x + 1$

$4 \leq 3x - 2y$



6) Simplify. $\frac{7}{n^2 + n} + \frac{2}{n^2 - n} - \frac{4}{n^2 - 1}$

7) Simplify.

$$\frac{4(x + 2y)}{81x^2 - 49y^2} \div \frac{x^2 - xy - 6y^2}{9xy^2 - 7y^3}$$

8) It took me $\frac{3x^2 - 9x}{x}$ minutes to go $\frac{2x - 6}{4x^2}$ miles.

What is my rate in miles per minute?

9) Factor the expression.

$2x^3 – 24x^2 + 64x$

10) Solve for x.

$-2x^3 + 7x^2 - 3x = 0$

© Research Parent

Name: _____

1) Order the numbers from least to greatest.

$0.5, \frac{1}{5}, -5, -0.5$

$-5, -0.5, \frac{1}{5}, 0.5$

2) Solve.

$5 + 24 \div 3 \times 2 = 21$

8×2

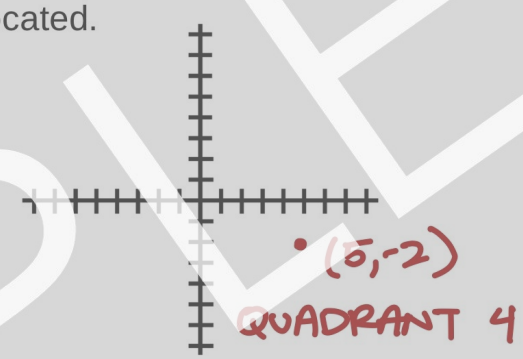
16

3) The temperature was -15 °F one morning. By the afternoon, it had risen 28 °F. What temperature was it in the afternoon?

$28 - 15 \rightarrow 13°F$

13

4) Graph the ordered pair (5, -2) on the coordinate plane and specify in which quadrant it is located.



5) Fill in the missing comparison symbol.

$4.2 - 6.3 \; < \; -8.5 + 6.6 = -1.9$

$6.3 - 4.2 = 2.1$ " -2.1

$8.5 - 6.6 = 1.9$

6) Identify the terms in the expression.

$\frac{14a}{2+b} + b - 3ac + \frac{c}{5}$

$\frac{14a}{2+b}, b, -3ac, \frac{c}{5}$

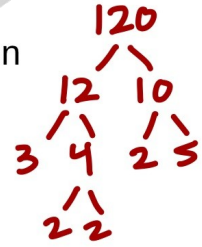
7) Write the total area of this rectangle in two different ways.



$4(x+7) = 4x + 28$

8) Write an algebraic expression for the product of *y* and 7 less than *x*.

9) Find the prime factorization of $120x^2yz^3$.



$2 \cdot 2 \cdot 2 \cdot 3 \cdot 5 \cdot x \cdot x \cdot y \cdot z \cdot z \cdot z$

10)

The answer key for all grades is included in my **Patreon membership**. Individual grade levels can also be purchased on **Etsy**. Thank you for your support!

SAMPLE

© Research Parent

Stay Connected!

Check out my blog **Research Parent** for free printables and fun, educational activities.





Terms of Use

© Research Parent. All Rights Reserved by the author.
This product is to be used by the original downloader only. Copying for more than one family, teacher, classroom, department, school, or school system is prohibited. This file may not be uploaded to the internet in any form. Failure to comply is a copyright infringement and a violation of the Digital Millennium Copyright Act (DCMA). I retain the right to modify these terms at any time. Thank you for respecting my work!

You May

- Make copies of this product for your personal use or student use in a single classroom.
- Direct interested parties to my blog, Patreon site, or store by providing the link where they may obtain the file.
- Purchase multiple licenses at a discount for colleagues and others to use this resource.
- Enjoy this product for years to come (check back for updated versions).

You May Not

- Share this resource (part of it or its entirety) with others.
- Copy this item for use by others.
- Upload this file to the internet for download or sale. This includes personal websites, Google classrooms, district websites, etc.
- Use any part of this resource to create your own resource.
- Claim this work as your own, alter the work in any way, or attempt to remove the copyright.

About the Author

Hi, I'm Michelle! I have a master's degree and PhD in engineering from Stanford University and a bachelor's degree from Caltech. I also have a master's in Education and a single subject credential in Physics. I am an engineer and computer scientist by trade, but currently I am homeschooling my 4 kids in elementary through high school while working for a California homeschool charter. In my spare time, I enjoy reading, hiking, and photography.



Patreon Perks

The most cost-effective way to access my resources is by signing up to become a **Research Parent Patreon member**! Here are just a few of the member benefits included for the $5/month fee. This list is continuously growing!



The Minimalist Math Library includes all of my math curriculum, answer keys, task cards, and mastery checklists for grades 1 through 7. Algebra 1 is also included separately in the membership. With Patreon support, I am hoping to create Minimalist Geometry as well!







Patrons also receive various other gifts with their membership like my favorite TPT products and the digital notebooks I create.

© Research Parent