Algebra 1: The Fundamentals
Student Review Guide

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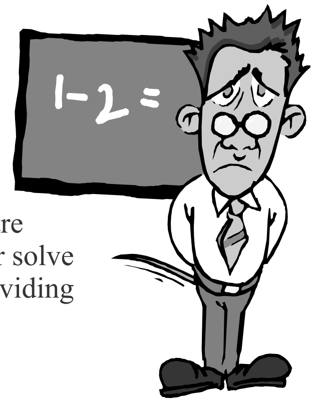
Algebra Basics

Section 1.3
Positive and Negative Numbers

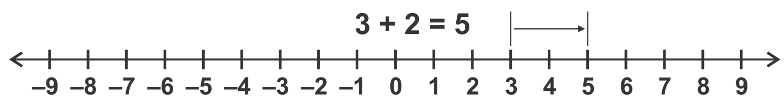


Algebra involves using variables to represent unknown values. Important skills in algebra are simplifying expressions and solving equations. In order to simplify algebraic expressions or solve algebraic equations, you need to know the rules for adding, subtracting, multiplying, and dividing positive and negative numbers.

Adding Numbers

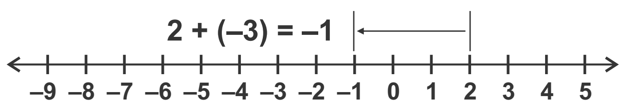
You've been adding numbers since first grade, but let's do a quick review on how number lines can be used. To add positive numbers, start at the first number. Then move from that position to the right by the number of units equal to the addend (or second number).

Look at this easy example. Start at 3 on the number line. The second number is 2, so move 2 places to the right. Wherever you end up is the sum. In the case of 3 + 2, the sum is 5.



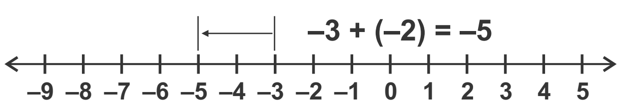
Negative numbers are to the left of zero on the number line. To add a negative number means to move left instead of right.

Example 1: **What is the sum of 2 + (–3)?**



Start by finding the first number, 2, on the number line. Now look at the second number, –3. The negative sign indicates that you move left instead of right. Move three units to the left. The result is –1.

Example 2: **What is the sum of –3 + (–2)?**



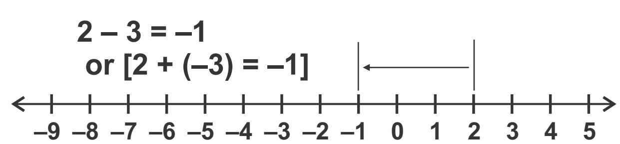
The first number is –3, so find it on the number line. It is to the left of zero since it is negative. Now add –2. Again, the negative sign indicates that you move left instead of right. The sum is –5.

Subtracting Numbers

Subtraction means "take away," and the subtraction symbol (–) often is read as ***take away*** or ***minus***. When you subtract two positive numbers, you take the second from the first. The subtraction symbol, just like a negative sign, means ***move in the opposite direction*** or ***reverse***.

Example 3: **What is the difference of 2 – 3?**

Going back to the number line, the first number is positive, so start at positive 2. The second number is also positive, but the subtraction sign means "reverse." Rather than moving to the right, you move three units to the left.

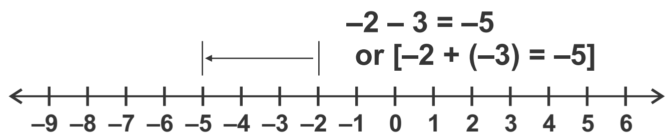


Compare this example to Example 1 above where a negative number was added. Can you see that subtracting a positive number is the same as adding a negative number?

Section 1.3, continued
Positive and Negative Numbers

Subtracting a positive number from a negative number is like adding two negative numbers.

Example 4: **What is the difference of –2 – 3?**



Start at –2. The second number is positive, but the subtraction sign means “reverse.” Instead of moving to the right, you move three units to the left. The difference is –5.

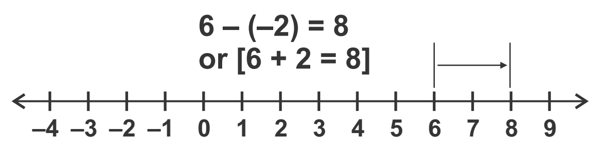
Now, the fun begins. Subtracting a negative number is the same as adding a positive number. Look at the examples below and use the number line to see why.

Example 5: **What is 6 – (–2)?**

Start at positive 6.

The second number is –2, which would normally mean you move to the left. However, the subtraction sign means you ***reverse*** the direction. When you reverse the move to the left, you move right instead.

The result is positive 8.

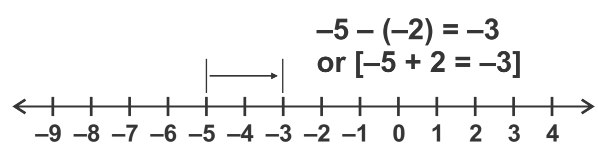


Subtracting two negative numbers is done the same way.

Example 6: **What is –5 – (–2)?**

The first number is –5, so start there.

The second number is –2, but not so fast. The subtraction symbol means ***reverse***, so go to the right instead. See how this problem is the same as (–5 + 2)?



Multiplying Numbers

When you multiply two numbers, you get a **product**. But when the factors have signs, you also have to take them into account in determining the sign of the product. Don’t panic. It’s not as difficult as you think. There are two simple rules that will help you keep it straight. (Remember that the raised dot is also a symbol for multiplication.)

Rule for Multiplying Numbers with the Same Signs

If signs are the same (+, + or –, –), the product is positive.

2 • 3 = 6 **–2 • –3 = 6**

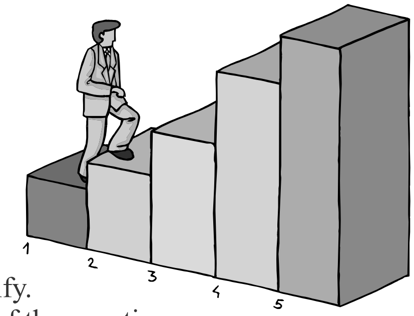
Rule for Multiplying Numbers with Different Signs

If signs are different (+, – or –, +), the product is negative.

2 • –3 = –6 **–2 • 3 = –6**

Multi-Step Equations

Section 6.1
Introduction to Multi-Step Equations



Only the most basic equations require the use of one principle (addition or multiplication) at a time. Most require the use of a combination of the two to simplify. That's what we mean by "multi-step." Equations that have constants on both sides of the equation and a coefficient in front of the variable take both the addition and multiplication principles. To solve, just take it one step at the time.

Example 1: **Simplify the equation $3m + 4 = 13$.**

Step 1: First, use the addition principle to eliminate the +4 by adding the opposite.

$$\begin{aligned} 3m + 4 &= 13 \\ -4 &= -4 \\ \hline 3m &= 9 \end{aligned}$$

Step 2: Next, use the multiplication principle to eliminate the coefficient of the variable. Remember, multiply by the reciprocal.

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

$$\frac{3}{3}\,m = \frac{9}{3}$$

$$m = 3$$

Step 3: Use the substitution principle to check the solution.

Check:

$$3(3) + 4 = 13$$

$$9 + 4 = 13$$

$$13 = 13$$

Now look at an example that doesn't work out so neatly.

Example 2: **Simplify the equation $\frac{2}{3}x - 1 = 4$.**

Step 1: In this example, first eliminate the –1 by adding +1 to both sides.

$$\begin{aligned} \frac{2}{3}x - 1 &= 4 \\ +1 &= +1 \\ \hline \frac{2}{3}x &= 5 \end{aligned}$$

Step 2: Next eliminate the coefficient of x by multiplying by its reciprocal. The answer is an improper fraction, so convert to a mixed number as the final solution.

$$\left(\frac{3}{2}\right)\left(\frac{2}{3}\right)x = \left(\frac{5}{1}\right)\left(\frac{3}{2}\right)$$

$$x = \frac{15}{2} \text{ or } 7\frac{1}{2}$$

Step 3: Use the improper fraction form to check the solution.

Check:

$$\left(\frac{\cancel{2}}{\cancel{3}}\right)\left(\frac{\overset{5}{\cancel{15}}}{\cancel{2}}\right) - 1 = 4$$

$$5 - 1 = 4$$

$$4 = 4$$

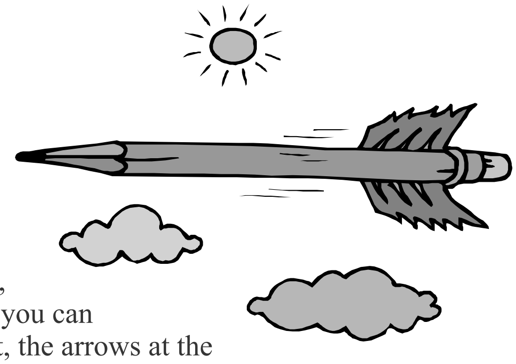
Practice

Solve the following multi-step equations by using the addition principle and the multiplication principle. Show your work and write your final answer in the blank provided. Convert improper fractions to mixed numbers. Be sure you check each solution by using substitution.

1. $3m - 2 = 7$ ________	2. $2a + 5 = -2$ ________	3. $\frac{1}{3}x + 2 = 2$ ________
4. $14c + 2 = 4$ ________	5. $-2x - 4 = 6$ ________	6. $-\frac{1}{2}m - 3 = 2$ ________
7. $-2x + 1 = -6$ ________	8. $3y - 7 = 1$ ________	9. $-\frac{2}{3}a + 5 = 1$ ________
10. $-\frac{3}{4}y - 1 = 5$ ________	11. $\frac{2}{5}x + 2 = -1$ ________	12. $\frac{2}{3}c - 9 = -2$ ________

Inequalities

Section 8.3
Graphing Inequalities

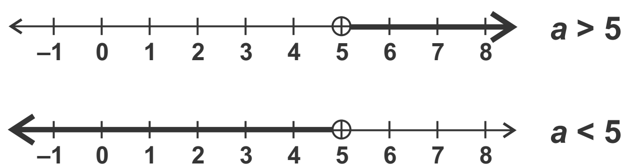


To show the solution set for an inequality, you can also draw a graph. When the solution set has only one variable, the graph is a number line. A number line is a single line that runs infinitely in both directions — positive numbers, negative numbers, and zero included. You don't always see all three because you can draw only the portion of the number line that is needed for your solution. But, the arrows at the ends of the number line indicate it keeps going in both directions to include all numbers.

The solution on a number line begins with a circle as the starting point. To indicate "greater than" or "less than," you use an open circle. To show "greater than or equal to" or "less than or equal to," you use a solid circle. To indicate the direction of numbers that satisfy the inequality, a thicker line is drawn on or above the number line. Look at the examples below.

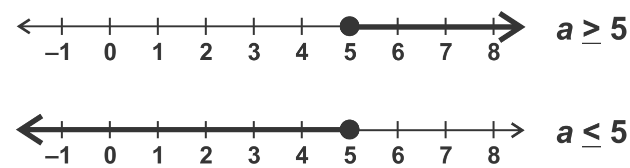
Open Circle

$>, <$



Solid Circle

$\geq, \leq$



REMEMBER!

If the comparison is "greater than" or "less than," leave the circle open.

If the comparison is "greater than or equal to" or "less than or equal to," color in the circle.

Hint: Do you notice anything about the direction of the solution set in comparison with the inequality sign? As long as the variable is on the left, the inequality sign will point in the direction of the solution set. Caution: This only works if the inequality is completely solved and the variable is on the left.

Example 1: **Graph the solution for the inequality $-2(x + 2) < 6$.**

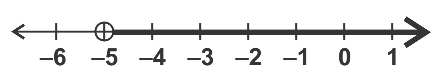
Before you can graph, you must solve the inequality. $-2(x + 2) < 6$

Step 1: Use the distributive property to clear the parentheses. $-2x - 4 < 6$

Step 2: Eliminate the –4 by using the addition principle. $-2x < 10$

Step 3: Eliminate the –2 by using the multiplication principle. Reverse the sign when multiplying by a negative. $x > -5$

Step 4: Now you can graph the solution. Draw an open circle around –5. The thick line points to the right, the same direction as the inequality symbol.



Example 2: **Graph the solution for the inequality $-1 \leq -x + 2$.**

$$-1 \leq -x + 2$$

Step 1: Use the addition principle to eliminate the +2.

$$-3 \leq -x$$

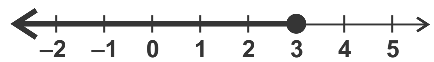
Step 2: Eliminate the minus sign by using the multiplication principle. Reverse the sign when multiplying by a negative.

$$3 \geq x$$

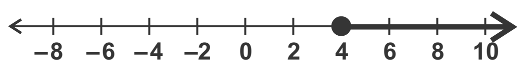
Step 3: Rearrange the inequality so that the variable is on the left.

$$x \leq 3$$

Step 4: Now you can graph the solution. Draw a solid circle around 3. The thick line points to the left, the same direction as the inequality symbol.



Example 3: **The solution for an inequality is graphed on the number line below.**



Which solutions of the following inequalities are represented by the graph?

$2x - 2 \geq 6$ $\quad 8 \geq 2x$ $\quad -x + 2 \leq 6$ $\quad -x + 4 \leq 0$

This problem is similar except you have to work backwards.

First, look at the graph. What is the solution represented by the graph? Hopefully you recognize that it is $x \geq 4$.

$$x \geq 4$$

Now simplify each inequality to see which ones match. The steps for simplifying each are shown below.

$$\begin{array}{l} 2x - 2 \geq 6 \\ \quad +2 \quad +2 \\ \hline \dfrac{2x}{2} \geq \dfrac{8}{2} \\ x \geq 4 \end{array}$$

yes

$$\begin{array}{l} \dfrac{8}{2} \geq \dfrac{2x}{2} \\ 4 \geq x \\ x \leq 4 \end{array}$$

no

$$\begin{array}{l} -x + 2 \leq 6 \\ \quad -2 \quad -2 \\ \hline -x \leq 4 \\ \times(-1) \quad \times(-1) \\ x \geq -4 \end{array}$$

no

$$\begin{array}{l} -x + 4 \leq 0 \\ \quad -4 \quad -4 \\ \hline -x \leq -4 \\ \times(-1) \quad \times(-1) \\ x \geq 4 \end{array}$$

yes

From this example, you can see how easy it would be to make a small mistake to give you a wrong answer. Be careful when simplifying inequalities. Write down each step.

Rational Expressions

Section 11.2
Negative Exponents

So far all the division of monomials you have seen has been with positive exponents. What happens when the rational expression has negative exponents? You pray. Just kidding. Negative exponents aren't really that bad. You just have to pay attention — very careful attention. Let's start with a short review of what you already know about negative exponents.

Rules for Negative Exponents

$y^{-7} \longrightarrow \dfrac{1}{y^7}$

You've already seen that you can make a negative exponent positive by moving the variable to the denominator. But what if you already have a rational expression and the negative exponents are in the numerator or denominator? You move the variables. Here's how.

$\dfrac{x^{-3}y^2}{y^2} \longrightarrow \dfrac{y^2}{x^3y^2}$

If the negative exponent is in the numerator, you *move* the variable to the denominator. If the negative exponent is in the denominator, move the variable to the numerator. It's just that simple. When you move variables with negative exponents, the exponents become positive.

$\dfrac{x^2}{x^3y^{-2}} \longrightarrow \dfrac{x^2y^2}{x^3}$

$\dfrac{2x^{-2}y^{-2}}{3x^{-3}y^{-4}} \longrightarrow \dfrac{2x^3y^4}{3x^2y^2}$

If you have all negative exponents in the numerator and the denominator, the variables swap places. Be sure you don't swap the coefficients; they already have a positive exponent. They're raised to the power of +1.

Negative Exponents in Rational Expressions

If a rational expression has variables with negative exponents, use the rules above to make them positive. Once you make the exponents positive, you can simplify the rational expression by canceling common factors. Take a look at these examples.

Example 1: **Simplify the expression** $\dfrac{16x^{-3}y^4z^{-2}}{12x^2y^2z^3}$.

Since there are variables with negative exponents in the numerator, you *move* those variables to the denominator. Once all the exponents are positive, you can add the exponents that have the same base.

$$\frac{16x^{-3}y^4z^{-2}}{12x^2y^2z^3}$$

Step 1: Move the variables with negative exponents to the denominator and make the exponents positive.

$$\frac{16y^4}{12x^2x^3y^2z^3z^2}$$

Step 2: Add the exponents with the same bases.

$$\frac{16y^4}{12x^{2+3}y^2z^{3+2}} \longrightarrow \frac{16y^4}{12x^5y^2z^5}$$

Step 3: Factor the coefficients if you can.

$$\frac{\cancel{4}\cdot 4\cancel{y^4}^{\,y^2}}{\cancel{4}\cdot 3x^5\cancel{y^2}z^5}$$

Step 4: Cancel the common factors in the coefficients and use the shortcut to cancel exponents.

Step 5: After canceling, regroup what's left.

$$\frac{4y^2}{3x^5z^5}$$

If you have variables with negative exponents in the denominator, you use the same process. Move the variables to the numerator to make the exponents positive, and then add the exponents with the same bases.

Example 2: **Simplify the expression** $\dfrac{2xy^4z}{4x^2y^{-3}z^{-2}}$.

$$\frac{2xy^4z}{4x^2y^{-3}z^{-2}}$$

Step 1: Move the variables with negative exponents from the denominator to the numerator and make the exponents positive.

$$\frac{2xy^4y^3zz^2}{4x^2}$$

Step 2: Add the exponents with the same bases. The tricky part here is adding the exponents for the *z*'s. Don't forget that a variable by itself has a power of 1. When simplifying the *z*'s, remember to add 1 to the other exponent of 2.

$$\frac{2xy^{4+3}z^{1+2}}{4x^2} \longrightarrow \frac{2xy^7z^3}{4x^2}$$

Step 3: Factor the coefficients.

Step 4: Cancel the common factors in the coefficients and use the shortcut to cancel exponents.

$$\frac{\cancel{2}\cancel{x}y^7z^3}{\cancel{2}\cdot 2\underset{x}{\cancel{x^2}}}$$

Step 5: After canceling, regroup what's left.

$$\frac{y^7z^3}{2x}$$

Ready for a new wrinkle? Let's put variables with negative exponents in the numerator and the denominator. How's that for really ugly — or is it?

Example 3: **Simplify the expression** $\dfrac{6x^{-3}y^4z^2}{9x^{-2}y^{-2}z^3}$.

In this one, you have variables with negative exponents in both the numerator and the denominator. Use the same rules as before.

$$\frac{6x^{-3}y^4z^2}{9x^{-2}y^{-2}z^3}$$

Step 1: Move the *y* in the denominator to the numerator and make the exponent positive.

$$\frac{6x^2y^4y^2z^2}{9x^3z^3}$$

Step 2: Swap the *x*'s in both the numerator and the denominator to make the exponents positive. Simplify the numerator.

$$\frac{6x^2y^{4+2}z^2}{9x^3z^3} \longrightarrow \frac{6x^2y^6z^2}{9x^3z^3}$$

Step 3: Factor the coefficients.

Step 4: Cancel the common factors in the coefficients and use the shortcut to cancel exponents.

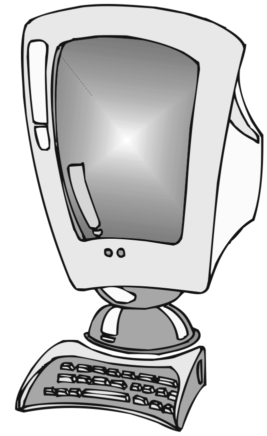
$$\frac{\cancel{3}\cdot 2\cancel{x^2}y^6\cancel{z^2}}{\cancel{3}\cdot 3\underset{x}{\cancel{x^3}}\underset{z}{\cancel{z^3}}}$$

Step 5: After canceling, regroup what's left.

$$\frac{2y^6}{3xz}$$

Slope as a Rate of Change

Section 21.2
Introducing Slope as a Rate of Change

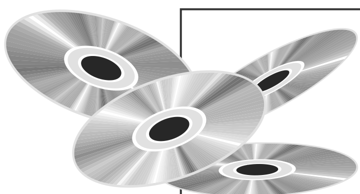


A rate of change compares the change in a dependent variable to the change in an independent variable. Think of it as a fraction with units. The word "per" is often used to make the comparison. Rates represent slopes.

miles **per** gallon	cost **per** item	feet **per** second	parts **per** million
$\frac{\text{miles}}{\text{gallon}}$	$\frac{\text{cost}}{\text{item}}$	$\frac{\text{feet}}{\text{second}}$	$\frac{\text{parts}}{\text{million}}$

Rate is the dependent quantity divided by the independent quantity. When you graph the relationship, the dependent quantity becomes the *y*-value, and the independent quantity becomes the *x*-value. What's the difference between a dependent variable and an independent variable? Consider the following:

$$\frac{\Delta y}{\Delta x} = \frac{\textbf{Dependent Quantity}}{\textbf{Independent Quantity}}$$



"I want to buy some cd's," said Serina. "How much are they?"
"Nine dollars each," replies the clerk.
"How much will that be?" Serina asks.
"Depends," responds the clerk, "on how many you buy."
"So cost depends on how many cd's?" Serina asks.
"Exactly," the clerk says.

What does all that mean? The change in the dependent quantity "depends" on the change in the independent quantity. In the example, total cost *depends* on the number of cd's, so cost is the dependent variable, and the number of cd's is the independent variable. So what does that have to do with slope? Slope equals the rate of change.

Practice 1

Determine the independent and dependent variables in each of the following. Label the independent variable with an *I* and the dependent variable *D*.

Example:	A sports utility vehicle gets about 18 miles per gallon.	D	miles	I	gallons
1.	The speed of light is given in miles per second.	______	miles	______	second
2.	The post office charges by the ounce to mail a letter.	______	ounce	______	cost
3.	The weight of an infant is monitored over several months.	______	weight	______	months
4.	Every five minutes, a machine produces three widgets.	______	time	______	widgets
5.	At summer camp, every 4 student campers must have 1 adult camp leader.	______	campers	______	leaders

Section 21.2, continued
Introducing Slope as a Rate of Change

Now that you understand the difference between dependent and independent variables, let's take a look at what linear equations can represent in real-world problems.

In Section 4.3, you worked with algebraic word problems that use rates. The equation that represents the rate problem is a linear equation. Each part of the equation relates to the graph of the resulting line.

The *y* is the dependent variable, the slope is the rate, the *x* is the independent variable, and the *b* is the starting point when the independent variable is zero (which is the *y*-intercept).

$$y = mx + b$$

y	m	x	b
dependent variable	rate	independent variable	starting point

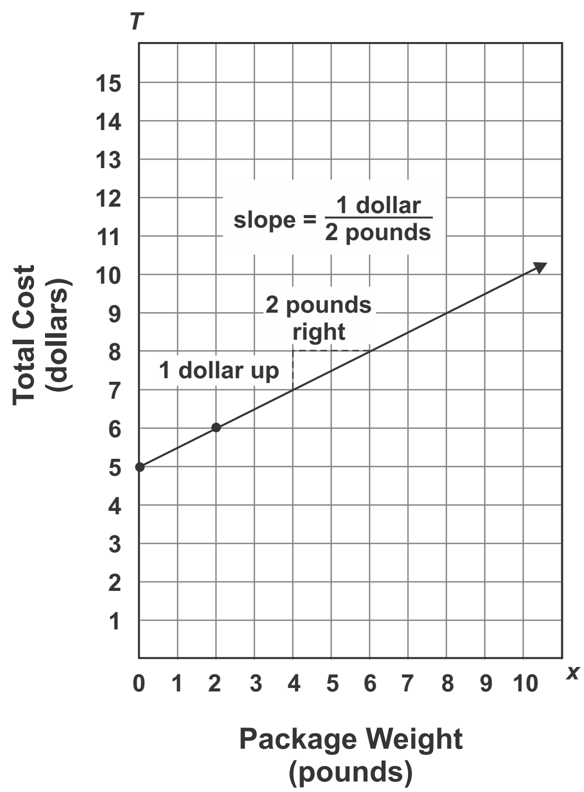
Example 1: **A company charges a flat fee of $5.00 to ship a package plus $0.50 per pound the package weighs. Write an equation that represents the total cost, *T*, for shipping a package weighing *x* pounds. Graph the line.**

You saw the equation for this problem in Section 4.3, but now, let's review what each part of the equation stands for in terms of a linear equation.

$$T = 5 + 0.5x$$

First, let's rewrite the equation in slope-intercept form. To make the problem easier to see, rewrite the decimal as a fraction.

$$T = \frac{1}{2}x + 5$$



When you graph the line, you can see the relationships of each term in the equation.

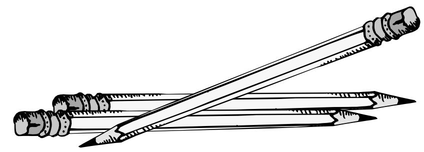
T, the total cost, is the dependent variable. Total cost depends on package weight, *x*. The *T* could be designated *y* instead, but in real-world problems, the dependent variable is not always *y*, and the independent variable is not always *x*. The dependent variable is plotted along the vertical axis of the graph.

In this case, *x* is the independent variable, and it is plotted on the *x*-axis of the graph.

The rate is $0.50 per pound, or in fraction form, it is 1 dollar per 2 pounds. That means the slope of the line is 1 over 2.

The starting point is $5.00. The starting point tells us that even if the package weighed zero pounds, the flat fee of $5.00 would still be the cost. That means the minimum cost is $5.00. $5.00 is the *T*-intercept.

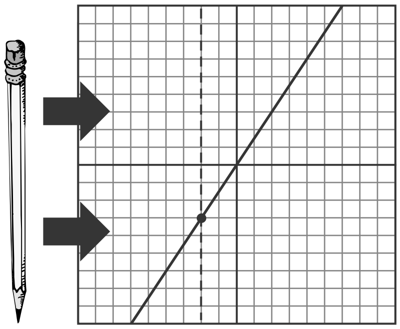
Functions
Section 25.2
Types Of Functions



To this point, all the graphs you have seen have been linear. Linear equations are functions as long as they are not vertical lines. But as you saw in the last sub-section, linear is not the only type of equation that can be a function. The other types you will most commonly encounter are quadratic, absolute value, and exponential. There's even one called a step function, but we'll get to that.

Vertical Line Test

To the right is a graph of a linear equation. It's a function because if you picked a set of points from the line, no value of x would have more than one value of y.



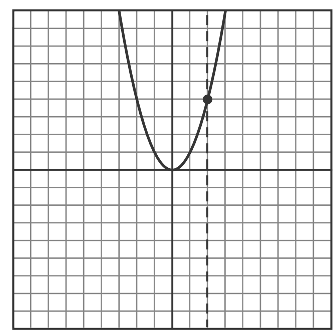
Linear

Another way you can tell, just from a graph, is called the ***vertical line test***. If you draw a vertical line anywhere on the grid and it intersects the graph in only one place, the graph is a function.

Another way to think of the vertical line test is the "pencil test." Lay your pencil across the graph vertically. If it's a function, it will intersect the graph at only one point no matter where you move it across the graphed line.

Any vertical line you draw through the graph of a linear equation will cross at only one point. Let's check some other types of graphs.

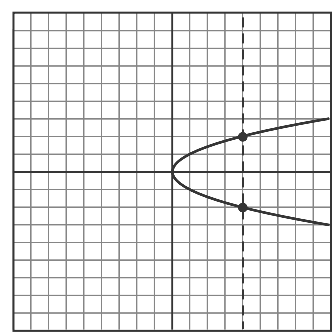
Quadratic Equations



Quadratic (x^2)

When you graph a quadratic equation, the graph is a **parabola**. This particular quadratic equation happens to be $y = x^2$. It opens upward because the coefficient of x is positive.

If you use the vertical line test, quadratic equations in the form of $y = ax^2 + bx + c$, when $a \neq 0$, are functions. Any vertical line on the graph would pass through only one point.

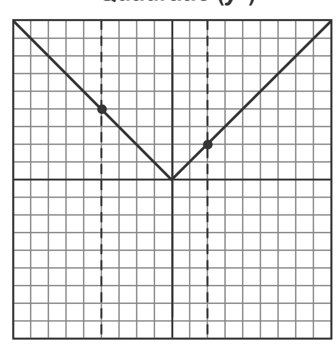


Quadratic (y^2)

When a quadratic equation has the y squared instead of the x, you also get a parabola. However, this time the parabola is not a function. Consider the equation $y^2 = x$. If you solve for y by taking the square root of both sides, you get $y = \pm\sqrt{x}$. Remember, when you take a square root, you have to consider both the positive and negative values. The graph of $y = +\sqrt{x}$ would be the top half of the parabola. To get the bottom half, you also have to graph $y = -\sqrt{x}$.

Apply the vertical line test to this graph and see what you get. The line crosses the graph in more than one place. That means it's not a function.

Absolute Value Equations



Absolute Value

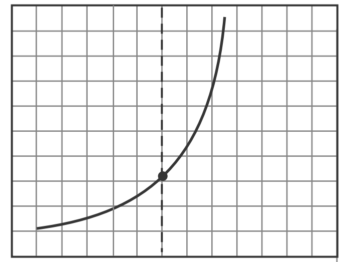
Similar to taking the square root of an equation, you also have to consider both the positive and negative cases when you evaluate absolute value. But this time, the graph is a bit different. The graph to the right shows $y = | x |$.

As you can see, the vertical line test confirms that this absolute value equation is a function. All absolute value equations are functions as long as they are in the form $y = a | x + b | + c$. ($x = | y |$ would not be a function.)

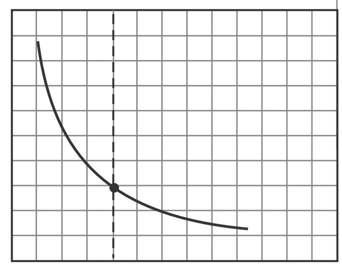
Section 25.2, continued
Types Of Functions

Exponential Equations

Exponential equations, when graphed, produce a curve similar to this one. Two of the most common forms of exponential equations are ***exponential growth*** and ***exponential decay***. In exponential equations, there is a product of constants with one of them raised to a power of the independent variable.



Exponential Growth



Exponential Decay

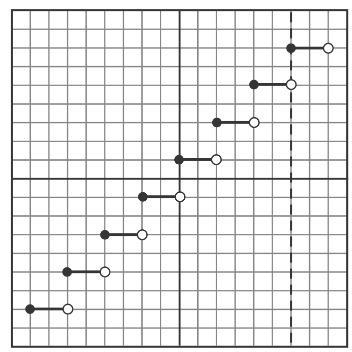
$$y = a \cdot b^x$$

where *a* is a nonzero constant, *b* > 0 and *b* ≠ 1, and *x* is a real number.

Sounds complicated, doesn't it? Fortunately, all you need to do is determine if the graph of an exponential equation is a function by using the vertical line test. When you graph exponential growth, the curve slopes upward. An exponential decay curve slopes down. And, as you can see, both are functions.

Step Functions

You may not hear much about step functions in Algebra 1, but you may be asked to determine if the graph is a function. The graph of a step function is nothing but horizontal line segments that are disconnected from one another. The key is that the ***segments do not overlap***. As you may recall from number line graphs, the open circle on the end of the segment means that point is not included in the graph. So, as you can see, any vertical line would intersect the graph at only one point.

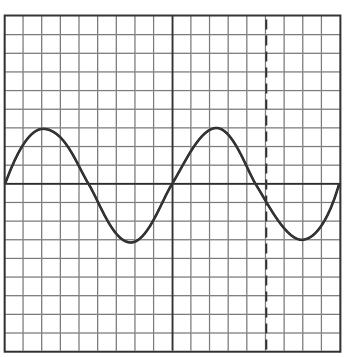


If you encounter a graph like this, just be aware that it will pass the vertical line test ***iff*** (*if and only if*) the line segments do not overlap. That makes it a function.

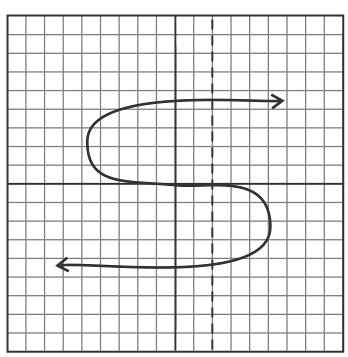
Unusual Functions

Even if you are given graphs that you don't recognize, don't panic. The vertical line test will determine whether the graph is a function.

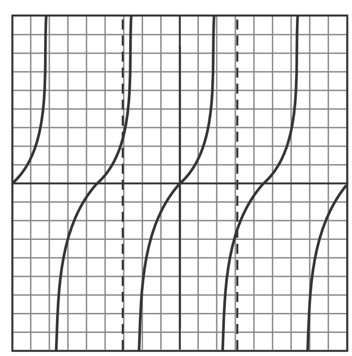
Function



Not a Function



Function



Algebra 1

DIRECTIONS

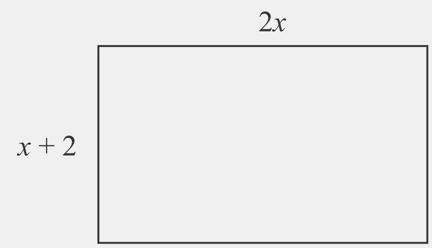
Read each problem carefully. Then work the problem and find your answer among the answer choices.

SAMPLE A

What value of x makes the equation $x + 4 = 9$ true?

A 5
B 6
C 9
D 13

SAMPLE B



Which of these is equivalent to the perimeter of this rectangle?

A $3x + 2$
B $6x + 4$
C $2x^2 + 4x$
D $2x^2 + 2$

1. **Which of the following is equivalent to the expression shown below?**

$$\frac{8x^{-2}y^{2}z^{-2}}{6x^{-4}y^{-8}z^{-3}}$$

A $\frac{3}{4x^2y^{10}z}$

B $\frac{3x^2y^{10}}{4z}$

C $\frac{4x^2y^6}{3z}$

D $\frac{4x^2y^{10}z}{3}$

Ⓐ Ⓑ Ⓒ Ⓓ

2. **A small mail order catalog company pays a flat rate of $175 per year for a bulk mail permit to send out its catalogs plus a charge of $1.06 per catalog. If the company has an advertising budget of $2500, what is the maximum number of catalogs they can send out in a year without going over their budget?**

A 2193

B 2194

C 2195

D 2325

Ⓐ Ⓑ Ⓒ Ⓓ

3. **What is the equation of the line that contains the points (–2, 0) and (3, 5)?**

A $y = x - 2$

B $y = x + 2$

C $y = 5x + 2$

D $y = 5x - 2$

Ⓐ Ⓑ Ⓒ Ⓓ

4. **Which of the following is equivalent to the expression below?**

$$\frac{2ab^2}{6a^2b^2 + 2ab^2 + 4a^2b}$$

A $\frac{1}{6a^2b^2 + 4a^2b}$

B $\frac{1}{3a + 1 + 2ab}$

C $\frac{b}{3ab + b + 2a}$

D $\frac{b}{5a}$

Ⓐ Ⓑ Ⓒ Ⓓ

5. **What is the product of the solutions to the following quadratic equation?**

$$2x^2 - 5x - 12 = 0$$

A –12

B –6

C 0

D 5

Ⓐ Ⓑ Ⓒ Ⓓ

6. **Which of the following is $6y^2 - 8y + 10$ factored completely over the set of rational numbers?**

A $2(3y - 5)(y - 1)$

B $2(3y - 1)(y + 5)$

C $2(3y + 1)(y - 5)$

D $2(3y^2 - 4y + 5)$

Ⓐ Ⓑ Ⓒ Ⓓ

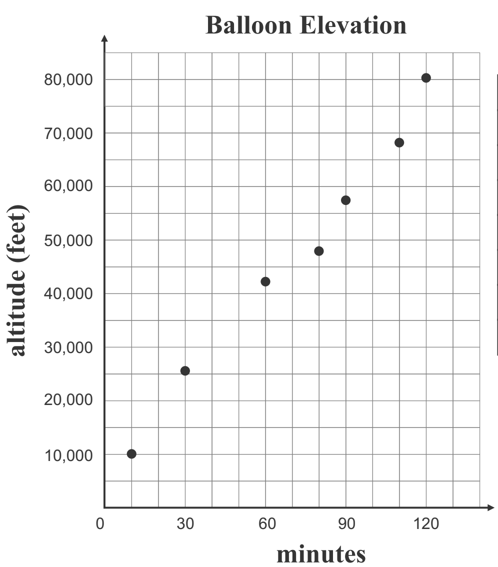
35. **Which of the following is equivalent to the expression shown below?**

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

A $-13x + 8y + 6$
B $-13x + 8y - 14$
C $-6x - 2y + 6$
D $-6x - 2y - 14$

Ⓐ Ⓑ Ⓒ Ⓓ

36. **The scatter plot below show the altitude of a weather balloon as it ascends into the atmosphere for two hours.**



x	y
10	10050
30	25200
60	42130
80	47000
90	57500
100	68250
120	80090

Which equation is closest to the line-of-best fit for this data?

A $y = 500x + 10$
B $y = 5000x + 742$
C $y = 759x + 5130$
D $y = 613x + 4264$

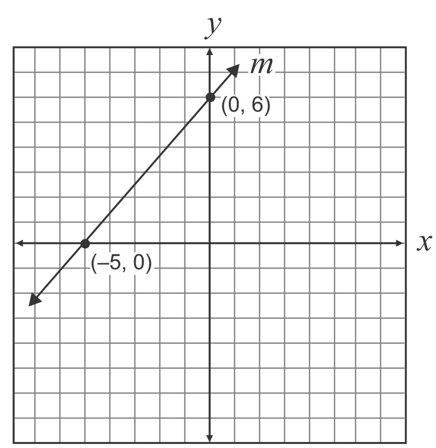
Ⓐ Ⓑ Ⓒ Ⓓ

37. **A certain function is represented by $f(x) = -2x + 4$. If the range of this function is {0, 2, 4}, what is the domain of the function?**

A {–4, 0, 4}
B {6, 8, 12}
C {–2, 2, 4}
D {0, 1, 2}

Ⓐ Ⓑ Ⓒ Ⓓ

38. **Line *m* is shown on the graph below.**



Which equation describes a line that is *parallel* to line *m*?

A $y = -\frac{6}{5}x - 6$

B $y = \frac{5}{6}x + 6$

C $y = \frac{6}{5}x + 6$

D $y = -\frac{6}{5}x + 6$

Ⓐ Ⓑ Ⓒ Ⓓ

Algebra 1
Practice Test 1
Evaluation Chart

If you missed question #:	Go to section(s):	If you missed question #:	Go to section(s):
1	3.1, 3.3, 11.1, 11.2	36	27.2
2	4.3, 8.4	37	25.3
3	17.1, 20.1, 20.2, 20.3, 20.6, 20.7	38	20.3, 22.4
4	13.1, 14.1	39	20.3, 22.5
5	13.4, 15.1, 16.4	40	27.2
6	13.1, 13.5, 15.4	41	23.2
7	7.2, 10.4, 10.6, 12.2	42	4.1, 24.2, 24.3, 24.6
8	20.3, 20.4	43	2.1, 10.3, 10.4, 10.5
9	5.2, 5.3, 6.1, 9.1	44	7.2, 7.4
10	19.1, 24.4, 24.5	45	7.2, 10.6, 26.4
11	20.2, 20.3, 20.7, 21.3, 21.4	46	15.2
12	4.1, 7.5	47	17.3
13	9.1, 9.3	48	25.1
14	27.2	49	17.4, 17.5
15	8.1, 8.2, 8.3	50	10.4, 12.1
16	21.2	51	27.2
17	13.4, 13.5	52	8.4, 8.5
18	20.3, 20.6	53	13.4
19	13.2, 13.6	54	27.1
20	10.4	55	8.1, 8.2
21	26.1, 26.2	56	23.2, 23.3
22	17.2, 20.1	57	1.4
23	13.4, 15.1	58	25.1, 25.4
24	21.2	59	27.2
25	2.1, 10.3, 10.4, 10.5	60	21.2, 21.6
26	4.3, 6.7	61	7.1, 7.5
27	23.4	62	13.4, 14.2, 14.3
28	20.3, 20.4	63	2.1
29	19.1, 19.2	64	1.3, 1.4, 2.2, 2.3
30	22.4, 22.5, 22.6, 24.1	65	21.2, 21.5, 22.1, 22.2
31	21.2, 21.6		
32	26.1		
33	26.3		
34	27.3		
35	2.1, 10.3, 10.4, 10.5		