Name: _____

2026-2027

King School Summer Math

Students Entering MAT 801

- **All work should be completed in this packet.**
- **Each problem should be clearly labeled with the problem number.**
- **Every answer should be circled.**
- **No final answers without supporting work will be accepted and will be required to be resubmitted.**
- **Please be sure to use notes from the previous years as well educational resources such as Khan Academy, IXL, etc.**
- **Working with a tutor on these exact problems is NOT permitted.**
- **Calculators and Photomath are NOT permitted.**
- **This assignment will be handed in on the first day of class and will count as your first assignment.**

Topics to be Covered

Chapter 1 ~ Rational Numbers

- Section 1.1 – Representing Rational Numbers on a Number Line
- Section 1.2 – Writing Rational Numbers as Decimals
- Section 1.3 – Adding Integers
- Section 1.4 – Subtracting Integers
- Section 1.5 – Multiplying and Dividing Integers
- Section 1.6 – Order of Operations with Integers
- Section 1.7 – Operations with Fractions and Mixed Numbers
- Section 1.8 – Operations with Decimals

Chapter 2 ~ Algebraic Expressions

➢ Section 2.1 – Adding Algebraic Terms

➢ Section 2.2 – Subtracting Algebraic Terms

➢ Section 2.3 – Simplifying Algebraic Expressions

➢ Section 2.4 – Expanding Algebraic Expressions

➢ Section 2.5 – Factoring Algebraic Expressions

➢ Section 2.6 – Writing Algebraic Expressions

➢ Section 2.7 – Real-World Problems: Algebraic Reasoning

Chapter 3 ~ Algebraic Equations and Inequalities

★ Section 3.1 – Identifying Equivalent Equations

★ Section 3.2 – Solving Algebraic Equations

★ Section 3.3 – Real-World Problems: Algebraic Equations

★ Section 3.4 – Solving Algebraic Inequalities

★ Section 3.5 – Real-World Problems: Algebraic Inequalities

Chapter 4~ Linear Equations and Inequalities

o Section 4.1 – Solving Linear Equations with One Variable

o Section 4.2 – Identifying the Number of Solutions to a Linear Equation

o Section 4.3 – Understanding Linear Equations with Two Variables

o Section 4.4 – Solving for a Variable in a Two-Variable Linear Equation

o Section 4.5 – Solving Linear Inequalities with One Variable

Chapter 5 ~ Lines and Linear Equations

- Section 5.1 - Finding and Interpreting Slopes of Lines
- Section 5.2 - Using Slope Intercept Form
- Section 5.3 - Writing Linear Equations
- Section 5.4 - Sketching Graphs of Linear Equations
- Section 5.5 - Real World Problems: Linear Equations

Additional Topics

- Multiplying Binomials

CHAPTER 1 – RATIONAL NUMBERS

Section 1.1 – Representing Rational Numbers on a Number Line

- Find absolute values of rational numbers.
- Express numbers in $\frac{m}{n}$ form.
- Locate rational numbers on a number line.

Section 1.2 – Writing Rational Numbers as Decimals

- Write rational numbers as terminating or repeating decimals.
- Compare rational numbers on the number line.

Section 1.3 – Adding Integers

- Add integers with the same sign.
- Add integers to their opposites.
- Add integers with different signs.

Section 1.4 – Subtracting Integers

- Subtract integers by adding their opposites.
- Find the distance between two integers.

Section 1.5 – Multiplying and Dividing Integers

- Multiply and divide integers.

Section 1.6 – Order of Operations with Integers

- Use addition, subtraction, multiplication, and division with integers.

Section 1.7 – Operations with Fractions and Mixed Numbers

- Add and subtract fractions and mixed numbers.
- Multiply and divide fractions and mixed numbers.

Section 1.8 – Operations with Decimals

- Add and subtract decimals.
- Multiply and divide numbers in decimal or percent form.

Vocabulary

- Opposite
- Set of Integers
- Positive Integer
- Negative Integer
- Negative Fraction
- Rational Number
- Terminating Decimal
- Repeating Decimal
- Zero Pair
- Additive Inverse
- Least Common Denominator
- Complex Fraction

Key Concepts

- Rational numbers are found in every segment on the number line.
- Rational numbers can be expressed in the form $\frac{m}{n}$ where m and n are integers with $n \neq 0$.
- The decimal form of a rational number is either terminating or repeating.
- You can use a number line or absolute value to add or subtract integers, rational numbers, and decimal numbers. The sum of positive numbers is positive. The sum of negative numbers is negative.
- Subtracting a number is the same as adding its opposite, or additive inverse.
    - Example:

      $3 - (-2) = 3 + 2$
- To evaluate the sum or difference of rational numbers with the same denominators, add or subtract their numerators.
    - Example:

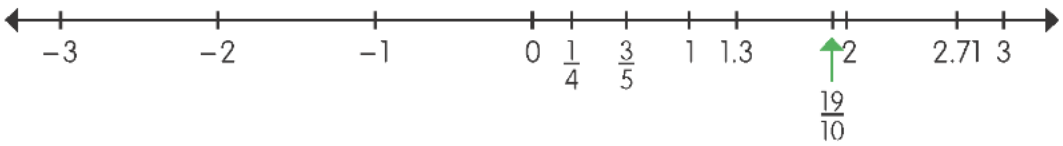
      $\frac{1}{5} + \frac{2}{5} = \frac{1+2}{5} = \frac{3}{5}$ and $\frac{2}{3} - \frac{1}{3} = \frac{2-1}{3} = \frac{1}{3}$
- To evaluate the sum or difference of rational numbers with different denominators, rewrite the rational numbers using a common denominator, and then add or subtract.
    - Example:

      $-3(-2) = 6$ and $3(-2) = -6$
- The product or quarter of two numbers with the same sign is positive. The product or quotient of two numbers with different signs is negative.

Recognizing Types of Numbers

Type of Number	Whole Numbers	Negative Numbers	Fractions	Decimals
Examples	$0,\ 1,\ 2,\ 3, \ldots$	$-1,\ -2,\ -3, \ldots$	$\frac{1}{4}, \frac{3}{5}, \frac{19}{10}, \ldots$	$1.3,\ 2.71, \ldots$

Graph the numbers in the table on a horizontal number line.



You can also graph the numbers on a vertical number line.

Comparing Decimals

When comparing two decimals, 1.945 and 1.954, you may use a place value chart to determine which decimal is greater.

	Ones	Tenths	Hundredths	Thousandths
1.945	1	9	4	5
1.954	1	9	5	4

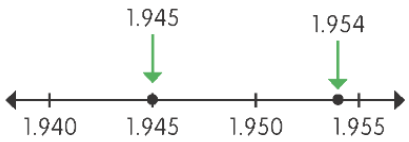
The two decimals have the same values in ones and tenths. So, we compare hundredths.

In the hundredths place, $4 < 5$. So, 1.954 is greater than 1945.

You can also use a number line to compare the decimals.

From the number line, you can see that 1.954 lies to the right of 1.954.

So, $1.954 > 1.945$.



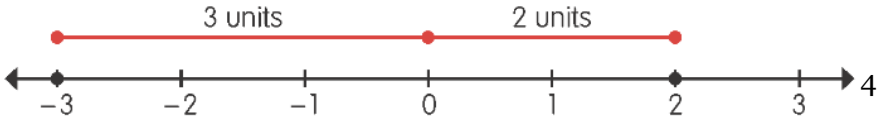
Determining Absolute Values

The absolute value of a number n is denoted by $|n|$.

- Examples:
  - $|2| = 2$
  - $|-3| = 3$

The absolute value of a number is a measure of its distance from 0.

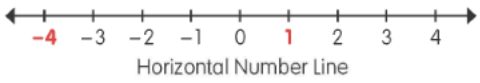
The distance from -3 to 0 is 3 units.



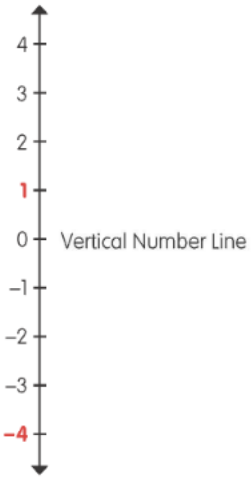
The distance from 2 to 0 is 2 units.

Comparing Numbers on a Number Line

You can use a number line to compare numbers. On a horizontal number line, the lesser number lies to the left of the greater number. On a vertical number line, the lesser number lies below the greater number.



Horizontal Number Line



Vertical Number Line

$-4 < 1$, because -4 is to the left of 1 on the horizontal number line, and -4 is below 1 on the vertical number line.

Using Order of Operations to Simplify Numerical Expressions

1) Perform operations within parentheses.
2) Evaluate exponents.
3) Multiply and divide from left to right.
4) Add and subtract from left to right.

Expressing Improper Fractions and Mixed Numbers in Other Forms

You can express improper fractions as mixed numbers.

$\frac{19}{4} = \frac{16}{4} + \frac{3}{4}$ Rewrite the fraction as sum.

$= 4 + \frac{3}{4}$ Write the improper fraction as a whole number.

$= 4\frac{3}{4}$ Then, write the sum as a mixed number.

You can express mixed numbers as improper fractions.

$2\frac{1}{5} = 2 + \frac{1}{5}$ Rewrite the mixed number as a sum.

$= \frac{10}{5} + \frac{1}{5}$ Write the whole number as a fraction.

$= \frac{11}{5}$ Then, write the sum as an improper fraction.

Adding and Subtracting Fractions

You can add and subtract fractions with unlike denominators.

$5\frac{2}{3} + 1\frac{3}{4} = 5 + \frac{2}{3} + 1 + \frac{3}{4}$ Rewrite the sum.

$= 6 + \frac{2}{3} + \frac{3}{4}$ Add the whole numbers.

$= 6 + \frac{2 \cdot 4}{3 \bullet 4} + \frac{3 \cdot 3}{4 \bullet 3}$ Rewrite the fractions as fractions with a common denominator.

$= 6 + \frac{8}{12} + \frac{9}{12}$ Simplify the products.

$= 6 + \frac{17}{12}$ Add the fractions.

$= 6 + 1\frac{5}{12}$ Write the improper fraction as a mixed number.

$= 7\frac{5}{12}$ Write the sum as a mixed number.

Multiply and Dividing Fractions

You can multiply two fractions.

- **Method 1**

$\frac{2}{3} \bullet \frac{3}{4} = \frac{2 \cdot 3}{3 \cdot 4}$ Multiply the numerators. Multiply the denominators.

$= \frac{6}{12}$ Simplify the product.

$= \frac{1}{2}$ Write the fraction in simplest form.

- **Method 2**

$\frac{2}{3} \bullet \frac{3}{4} = \frac{2}{3} \bullet \frac{3}{4}$ Divide a numerator and a denominator by the common factor, 2.

$= \frac{1}{3} \bullet \frac{3}{2}$ Divide a numerator and a denominator by the common factor, 3.

$= \frac{1 \cdot 1}{1 \cdot 2}$ Multiply the numerators. Multiply the denominators.

$= \frac{1}{2}$ Simplify the product.

You can divide a fraction by another fraction.

$\frac{3}{4} \div \frac{3}{8} = \frac{3}{4} \bullet \frac{8}{3}$ Rewrite using the reciprocal of the divisor.

$= \frac{3}{4} \bullet \frac{8}{3}$ Divide a numerator and a denominator by the common factor, 4.

$= \frac{\cancel{3}}{1} \cdot \frac{2}{\cancel{3}}$ Divide a numerator and a denominator by the common factor, 3.

$= \frac{1 \cdot 2}{1 \cdot 1}$ Multiply the numerators. Multiply the denominators.

$= 2$ Simplify the product.

Multiplying and Dividing Decimals

Ignore the decimal when you multiply. Then, decide where to place the decimal point in the product.

$$\begin{array}{r} {\scriptstyle 1}\\ 3.6\,2 \\ \times\quad 0.3 \\ \hline 1\,0\,8\,6 \\ 0\,0\,0 \\ \hline 1.0\,8\,6 \end{array} \begin{array}{l} \leftarrow \text{ 2 decimal places} \\ \leftarrow \text{ + 1 decimal place} \\ \\ \\ \\ \leftarrow \text{ 3 decimal places} \end{array}$$

You can express the division expression as a fraction when you divide by a decimal. Then, multiply the dividend and divisor by the same power of 10.

$17.8 \div 0.25 = \frac{17.8}{0.25}$ Write division as a fraction.

$= \frac{17.8 \cdot 100}{0.25 \cdot 100}$ Multiply both the numerator and the denominator by 100 to make the denominator a whole number.

$= \frac{1{,}780}{25}$ Simplify the product.

$= 71.2$ Divide as with whole numbers.

Chapter 2 – Algebraic Expressions

Section 2.1 – Adding Algebraic Terms

- Simplify algebraic expressions with integral, decimal, and fractional coefficients by adding like terms.

Section 2.2 – Subtracting Algebraic Terms

- Simplify algebraic expressions with integral, decimal, and fractional coefficients by subtracting like terms.

Section 2.3 – Simplifying Algebraic Expressions

- Simplify algebraic expressions with more than two terms.
- Simplify algebraic expressions by using the commutative property of addition.
- Simplify algebraic expressions with two variables.

Section 2.4 – Expanding Algebraic Expressions

- Expand algebraic expressions with fractional, decimal, and negative factors.

Section 2.5 – Factoring Algebraic Expressions

- Factor algebraic expressions with two variables.
- Factor algebraic expressions with negative terms.

Section 2.6 – Writing Algebraic Expressions

- Translate verbal descriptions into algebraic expressions with one or more variables.
- Translate verbal descriptions into algebraic expressions involving the distributive property.

Section 2.7 – Real-World Problems: Algebraic Reasoning

- Solve real-world problems using algebraic reasoning.

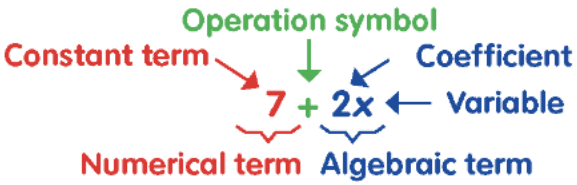
Key Concepts

- Algebraic expressions may contain more than one variable with rational coefficients and rational constants.
- Algebraic expressions are written in simplest form by adding and subtracting the coefficients of the like terms.
- Algebraic expressions may be simplified using the commutative property of addition.
- Algebraic expressions are expanded using the distributive property.
- Algebraic expressions are factored using the greatest common factor (GCF) of the terms and the distributive property.

- You can use diagrams, models, or tables to help solve real-world problems algebraically.

Recognizing Parts of an Algebraic Expression

A variable can be used to represent an unknown value or quantity. An algebraic expression is a mathematical phrase that includes variables, numbers, and operation symbols.



Evaluating Algebraic Expressions

Evaluate an algebraic expression by replacing all its variables with their assigned values.

Example: Given that $a = 5$ in the expression $2a - 3$, find the value of the expression.

$$\begin{aligned} 2a - 3 &= (2 \cdot 5) - 3 \\ &= 10 - 3 \\ &= 7 \end{aligned}$$

Simplifying Algebraic Expressions

Simplify expressions by adding or subtracting the coefficients of the like terms (terms that have the same variables with the same corresponding exponents). Algebraic terms cannot be added to or subtracted from constant terms.

Can be Simplified	Cannot be Simplified
• $4a + 3 + 6 = 4a + 9$	• $4x + 3y + 7$ has no like terms.
• $6x - 2x + 5 = 4x + 5$	• $2a - b + 3$ has no like terms.

Expanding Algebraic Expressions

Expand algebraic expressions by applying the distributive property to remove the parentheses.

$$\begin{aligned} 3(p + 2) &= 3(p) + 3(2) \\ &= 3p + 6 \end{aligned}$$

$$\begin{aligned} 6(w - 4) &= 6(w) - 6(4) \\ &= 6w - 24 \end{aligned}$$

Factoring Algebraic Expressions

Factoring is the inverse of expansion. Factor an algebraic expression by writing it as a product of its factors. Use the distributive property to factor expressions whose terms have a common factor.

$$2x + 10 = 2(x) + 2(5) \quad \text{The common factor of } 2x \text{ and } 10 \text{ is } 2.$$
$$= 2(x + 5)$$

Recognizing Equivalent Expressions

Equivalent expressions are expressions that are equal for any values of the variables. Use an equal sign to relate equivalent expressions.

$4(x + 3)$ and $4x + 12$ are equivalent expressions because they are equal for all values of x. So, you can write $4x + 12 = 4(x + 3)$.

Writing Algebraic Expressions to Represent Unknown Quantities

Mason is 2 years older than his brother Evan.

- When Evan is 12 years old, Mason will $(12 + 2) = 14$ years old.
- When Evan is x years old, Mason will be $(x + 2)$ years old.

Chapter 3 – Algebraic Equations and Inequalities

Section 3.1 – Identifying Equivalent Equations

- Identify equivalent equations.

Section 3.2 – Solving Algebraic Equations

- Solve algebraic equations with variables on the same side of the equation.
- Solve algebraic equations in factored form.

Section 3.3 – Real-World Problems: Algebraic Equations

- Solve real-world problems algebraically.

Section 3.4 – Solving Algebraic Inequalities

- Solve algebraic inequalities.
- Graph the solution set of an inequality on a number line.
- Solve multi-step algebraic inequality.

Section 3.5 – Real-World Problems: Algebraic Inequalities

- Solve real-world problems involving algebraic inequalities.

Vocabulary

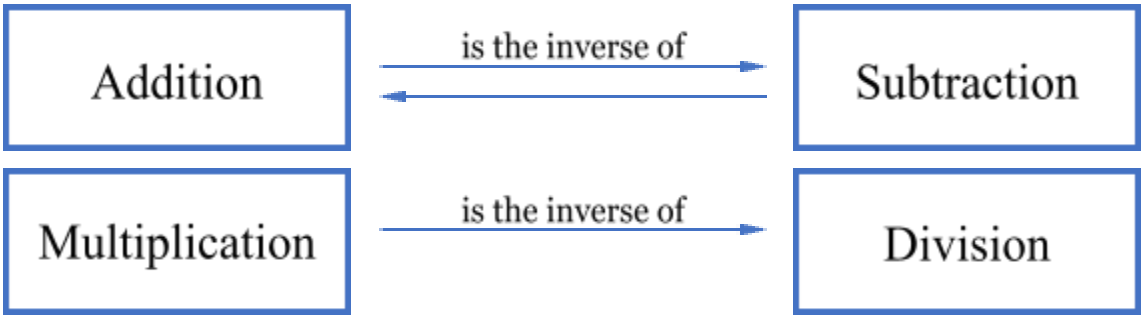
- Equivalent Equations
- Solution Set
- Equivalent Inequalities

Key Concepts

- Equations with the same solution are called equivalent equations.
- Solving an equation involves isolating the variable on one side of the equation by writing a series of equivalent equations.
- An inequality symbol is used to compare two quantities that are not equal or may not be equal.
- The orientation of the inequality symbol must be reversed when both sides of an inequality are multiplied or divided by the same negative number.

Solving Algebraic Equations by Balancing

You can use inverse operations to solve an equation. When you do, keep the equation balanced by performing addition, subtraction, multiplication, or division by the same nonzero number on both sides.



Solve each equation.

a) $x + 2 = 9$

$x + 2 = 9$

$x + 2 - 2 = 9 - 2$ Subtract 2 from both sides.

$x = 7$ Simplify.

b) $\frac{2}{3}x = 2$

$\frac{2}{3}x = 2$

$\frac{2}{3}x \div \frac{2}{3} = 2 \div \frac{2}{3}$ Divide both sides by $\frac{2}{3}$.

$\frac{2}{3}x \cdot \frac{3}{2} = 2 \cdot \frac{3}{2}$ Rewrite division as multiplication by the reciprocal of $\frac{2}{3}$.

$x = 3$ Simplify.

Solving Algebraic Equations by Substitution

You can use substitution to solve an algebraic equation.

Solve $x + 6 = 8$.

- If $x = 1$,

$x + 6 = 1 + 6$ Substitute 1 for x.

$= 7$ $(x \neq 8)$ 1 is not the solution.

- If $x = 2$,

$x + 6 = 2 + 6$ Substitute 2 for x.

$= 8$ 2 is the solution.

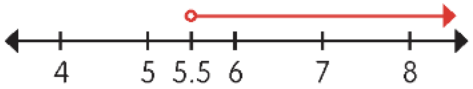
The equation $x + 6 = 8$ is true when $x = 2$.

$x = 2$ gives the solution of the equation $x + 6 = 8$.

Graphing Inequalities on a Number Line

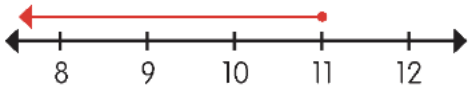
You can represent an inequality on a number line using circles and arrow.

$p > 5.5$



Use an empty circle to show that 5.5 is not a solution of the inequality.

$q \leq 11$



Use a shaded circle to show that 11 is a solution of the inequality.

Writing Algebraic Inequalities

Use $>$, $<$, $\geq$, $\leq$, or $\neq$ to compare unequal quantities or quantities that may not be equal.

Verbal Descriptions	Algebraic Inequality
The cost of an apple, a, **is not** \$3.	$a \neq 3$
The cost of a greeting card, c, is **less than** \$6.	$c < 6$
The mass of the strawberries, s, is **more than** 500 grams.	$s > 500$
The width of the pond, w, is **at most** 5 meters. OR The width of the pond, w, is **no more than** 5 meters. OR The width of the pond, w, is **less than or equal to** 5 meters.	$w \leq 5$
The length of the ribbon, r, is **at least** 10 inches. OR The length of the ribbon, r, is **no less than** 10 inches. OR The length of the ribbon, r, is **greater than or equal to** 10 inches.	$r \geq 10$

Chapter 4~ Linear Equations and Inequalities

Section 4.1 – Solving Linear Equations with One Variable

- Solve linear equations with one variable
- Write repeating decimals as fractions using linear equations
- Solve real-world problems involving linear equations with one variable

Section 4.2 – Identifying the Number of Solutions to a Linear Equation

- Identify a linear equation with no solution
- Identify a linear equation with infinitely many solutions

Section 4.3 – Understanding Linear Equations with Two Variables

- Express a linear relationship between two variables
- Represent a linear relationship using a table of values

Section 4.4 – Solving for a Variable in a Two-Variable Linear Equation

- Solve for a variable in a two-variable linear equation

Section 4.5 – Solving Linear Inequalities with One Variable

- Solve linear inequalities with one variable
- Solve real-world problems involving linear inequalities with one variable

Vocabulary

- Inconsistent Equation
- Consistent Equation
- Identity

Key Concepts

- A linear equation can have one or more variables.
- A consistent equation in one variable is an equation that has one solution.
- An inconsistent equation is an equation that has no solution.
- An identity is an equation that is true for all values of the variable.
- A linear relationship between two variables can be represented with an equation or a table of values.
- Solving for a variable in a multi-variable linear equation means expressing the variable in terms of the other variable(s).
- A linear inequality can have a variable on one or both sides.
- Linear equations and inequalities can be used to represent and solve real-world problems.

Chapter 5 ~ Lines and Linear Equations

Section 5.1 - Finding and Interpreting Slopes of Lines

- Use slopes to compare two unit rates
- Find the slope of a line given the graph
- Compare two slopes to make a conclusion about real-world situations
- Find slopes of horizontal and vertical lines
- Find the slope of a line passing through two given point

Section 5.2 - Using Slope Intercept Form

- Write an equation of a line in the form $y = mx$ or $y = mx + b$

Section 5.3 - Writing Linear Equations

- Use slope-intercept form to identify slopes and y-intercepts
- Write the equation of a line given its slope and y-intercept
- Write equations of parallel lines
- Write the equation of a line given its slope and a point on the line
- Write the equation of a line given a point on the line and the equation of a parallel line
- Write the equation of a line given two points

Section 5.4 - Sketching Graphs of Linear Equations

- Graph a linear equation by using a table of values
- Graph a linear equation by using m and b
- Graph a linear equation by using m and a point

Section 5.5 - Real World Problems: Linear Equations

- Explain slope and y-intercept in the context of real-world problems

VOCABULARY

- Slope
- Run
- x-Intercept
- Linear Relationship
- Rise
- y-Intercept
- Slope Intercept Form

Key Concepts

- The slope-intercept form of a linear equation is given by $y = mx + b$, where m represents the slope and b is the y-intercept of the graph of the equation.
- The slope of a line passing through two points (x_1, y_1) and (x_2, y_2) is equal to $\frac{y_2 - y_1}{x_2 - x_1}$ or $\frac{y_1 - y_2}{x_1 - x_2}$.
- The slope is always the same between any two distinct points on a line and can be positive, negative, zero or undefined.
- The equation of a horizontal line through the point (c, d) is $y = d$. The equation of a vertical line through the point (c, d) is $x = c$.
- You can write an equation of a line given the slope m and the y-intercept b, the slope m and a point, or the coordinates of two points.
- You can write an equation of a line parallel to a given line if you know the y-intercept of the line you want to draw or the coordinates of a point on the line you want to draw.
- You can use linear equations and graphs to model and solve real-world problems.

Complete the following sections to be turned in.

Rational Numbers

Evaluate each expression.

1) $2.6 \div (3.7 - 1.1)$

2) $5.6 + 2.5 - 1.28$

3) $3.8(4.9 - 4.8)$

4) $1 + 5 - 3.4$

5) $2.6 + 4.2 - 3.8$

6) $3 \times 1.5 - 1.5$

7) $(3.2 - 2.1) \times 6$

8) $1.8(4 + 1)$

9) $4.2 \times 4.1 - 1.7$

10) $5.4 + 1.5 \times 4.6$

11) $2-\left(3\frac{1}{6}-2\frac{4}{5}\right)$

12) $2\div\frac{3}{2}\times 1\frac{4}{5}$

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13) $2+\frac{3}{4}+1\frac{1}{3}$

14) $1\div\left(2\frac{1}{3}+1\right)$

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15) $3\frac{2}{3}\times\frac{11}{6}-\frac{3}{2}$

16) $3\frac{1}{2}\div\left(3\frac{1}{2}\times 2\frac{1}{6}\right)$

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17) $\left(3\frac{4}{5}+1\frac{2}{5}\right)\div 3\frac{3}{5}$

18) $\left(3\frac{1}{4}\right)^2-1$

19) $\left(4 - \frac{7}{4}\right) \div 2$

20) $2\frac{1}{2} - \frac{1}{2} + 3\frac{1}{6}$

21) $(7 - 3) \div 2$

22) $4 \div 2 + 3$

23) $(5 + 1) \times 2$

24) $4 - (6 - 6)$

25) $6 \times 5 - 4$

26) $(2 + 5) \times 6$

27) $2 \times 4 - 4$

28) $2^2 - 2$

Algebraic Expressions

Adding and Subtracting Algebraic Terms

Which expressions are equivalent to $\frac{3}{2}b - 2.45b$?

Choose **all** that apply.

(A) $-\frac{19}{20}b$

(B) $-\left(2.45b + \frac{3}{2}b\right)$

(C) $1.5b + \left(-\frac{49}{20}b\right)$

(D) $0.95b$

(E) $-\left(-1.5b + \frac{49}{20}b\right)$

Simplifying Algebraic Expressions

Which expressions are equivalent to $6d - 9b + b - 3d$?

Choose **all** that apply.

(A) $6d - 3d + 9b + b$

(B) $6d - 3d - 9b + b$

(C) $3d + 10b$

(D) $3d - 8b$

(E) $6d + 8b$

(F) $-8b + 3d$

Expanding Algebraic Expressions

Which expression is equivalent to $0.3\left(\frac{5}{2} - 6a\right)$?

(A) $0.6 - 6.3a$

(B) $0.75 - 1.8a$

(C) $7.5 - 3a$

(D) $1.5 - 1.8a$

Which expression is equivalent to $2s + 6t - 8$?

(A) $2(s + 6t - 8)$

(B) $2(s + 3t - 8)$

(C) $2(s + 3t - 4)$

(D) $2(s + 3t + 4)$

Writing Algebraic Expressions

The width of a rectangle is $2x$ yards. The length of the rectangle is 7 yards more than the width.

- Write an expression for the perimeter of the rectangle.
- Explain how you found the expression.

Write your expression and explanation in the space below.

Algebraic Equations and Inequalities

Solve each equation.

1) $-6 - 5x = 5(6 + 5x) + 6x$

2) $4(n - 8) = -2n + 10$

3) $-3(5a + 2) = -30 - 7a$

4) $5x + 37 = -8(4 + 8x)$

5) $19 - 3x = -8(6 - 8x)$

6) $\frac{1}{2}v + \frac{2}{3} + \frac{1}{6} = 1\frac{1}{12}$

7) $\frac{1}{2}n + \frac{1}{2}n = -1\frac{1}{2}$

8) $-\frac{329}{60} = 4\frac{3}{4}r - \frac{12}{5}r$

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

10) $\frac{3}{4}n + 1 - 3\frac{2}{3}n = \frac{211}{36}$

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11) $-9 - 4r = -2.1r - 4.3 - 2.9r$

12) $-1.6m - 1.24 = m + 2.4$

---

13) $-3.1 - 5n = n + 5.3$

14) $5.8x - 3.9 = -3.04 + 6x$

Real-World Problems: Algebraic Equations

The sum of two consecutive odd numbers is 72. What is the smaller number?

(A) 33

(B) 35

(C) 37

(D) 39

Solving Algebraic Inequalities

Which are the solutions of the inequality $-2x > -4$?

Choose **all** that apply.

(A) 2

(B) 1.5

(C) 1

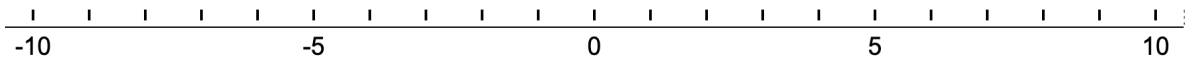
(D) 3.5

(E) 2.5

(F) −2

Solve the inequality $3x - 1 \leq 5$, and graph the solution set on a number line.

Show your answer and drawing in the space below.



Real-World Problems: Algebraic Inequalities

A bagel and a slice of pie cost $4. The slice of pie cost $1.60 more than the bagel. How much did the bagel cost?

Linear Equations and Inequalities

Identifying the Number of Solutions to a Linear Equation

Solve each linear equation and determine if it is consistent, inconsistent or an identity.

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

$7x - 10 = 3(x - 2) + 4(x - 1)$

Understanding Linear Equations with Two Variables

Find the value of y when x=2.

$y = \frac{1}{7}(x + 5)$

Solving for a Variable in a Two-Variable Linear Equation

Express y in terms of x. Then find the value of y when x=-1.

$4x - 3 = 0.4x - 2y$

Solving Linear Inequalities with One Variable

Solve the following inequality and graph the solution set on a number line.

$x + 19 \leq 6x - 41$

Lines and Linear Equations

Finding and Interpreting Slopes of Lines

Find the slope of each line.

16) $4x - y = -4$

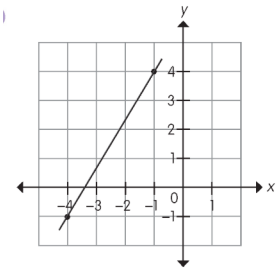
17) $x - 3y = -15$

18) $10x + y = 5$

19) $3x + 2y = -6$

20) $3x - 5y = 25$

Find the slope of the line.

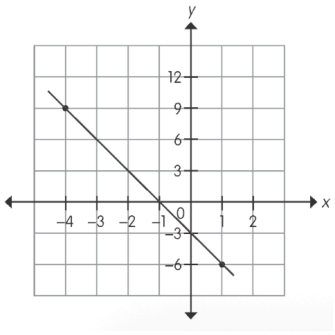


Find the slope of the line passing through the following points.

$P(0, -7)$ and $Q(-3, 5)$

Using Slope Intercept Form

Write an equation in the form $y = mx$ *or* $y = mx + b$



Writing Linear Equations

Per the information given, write a linear equation in slope intercept form.

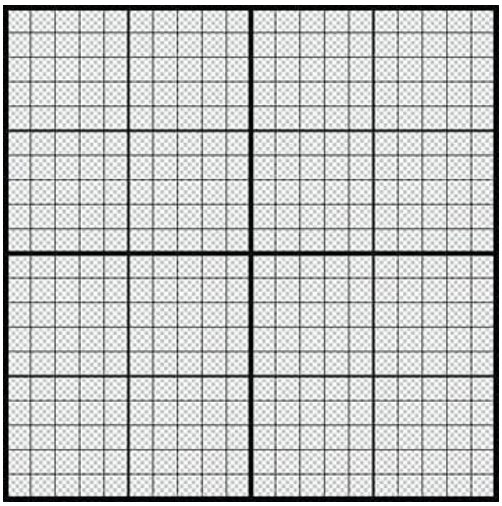
Slope, $m = \frac{1}{2}$
y-intercept, $b = 3$

A line has a slope of $-\frac{1}{3}$ and passes through the point (0, 4). Write the equation of the line.

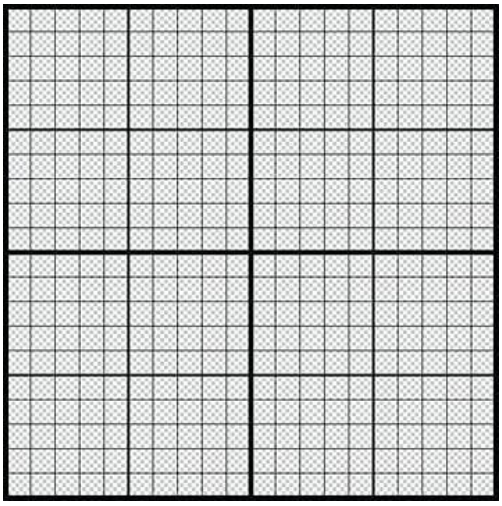
Sketching Graphs of Linear Equations

Using a coordinate plane, graph the following linear equation

$y = -x + 5$

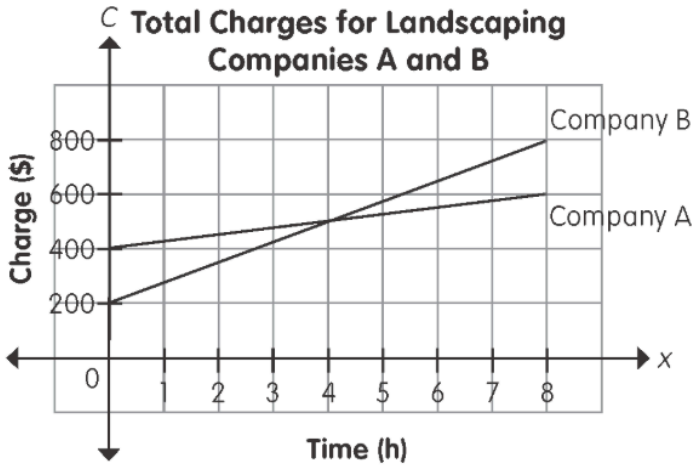


A line with a slope of $\frac{2}{3}$ that passes through the point (6, 1).



Real World Problems: Linear Equations

Landscaping Company A and Company B each charges a certain amount, C dollars, as consultation fee, plus a fixed hourly charge. The graph shows the total charges for x hours.



a Find the amount each landscaping company charges as its consultation fee.

b Which company charges a greater amount per hour?