

**MATH
& YOU**

concepts & connections

**HOW DO STUDENTS
SEE THE RELEVANCE
OF MATH?**

Building relevance by connecting math to



future



real world



you

Data Talk

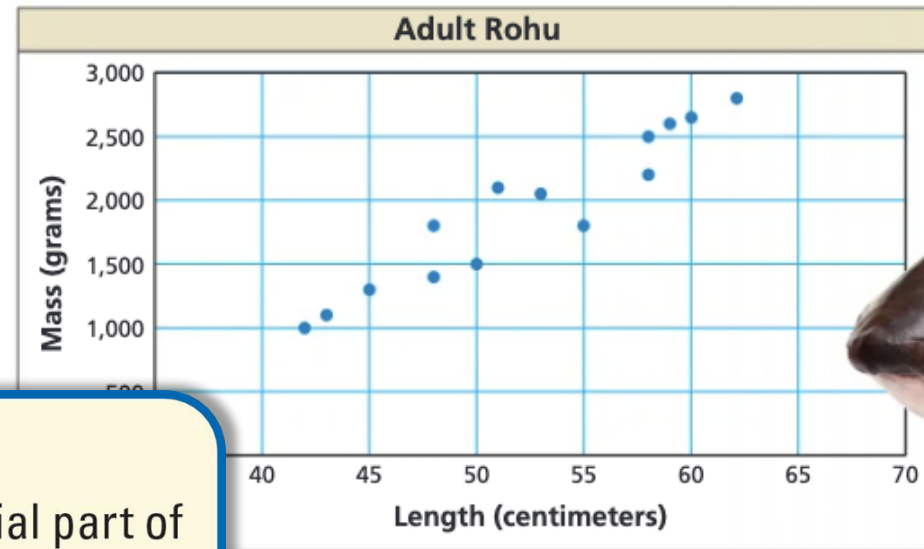
- ? "Why is there an axis break marking on the horizontal axis?"
- ? "How would the graph look different if the horizontal axis showed all the values between 0 and 40?"

Environmental Connections

- ? "In South Asia, seafood makes up a substantial part of most people's diet. In some countries, the yearly per capita seafood consumption is more than 40 kilograms. What does that mean?"
- ? "What can be done to protect bodies of water from overfishing?"

Interpreting Data

ROHU Rohu are members of the carp family and are found in the rivers of South Asia. The scatter plot shows the lengths x (in centimeters) and the masses y (in grams) of several adult rohu.



the relationship between x and y .

relationship can be modeled by the equation $90x - y = 2,670$. Approximate the mass of a rohu that is 57 centimeters long.

Now & Refresh

21. The function $D(t) = 75 - 0.3t$ represents the number of gigabytes left after downloading a

Solve the inequality. Graph the solution

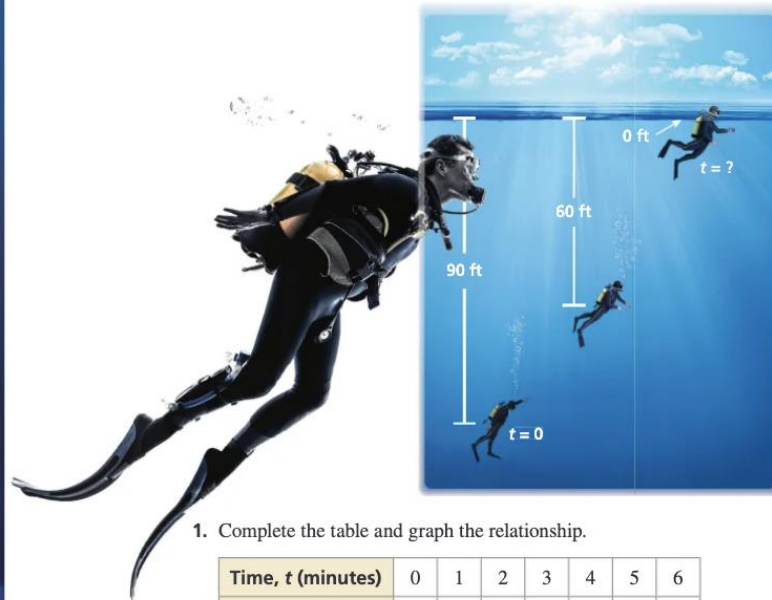
24. $b + 5 \leq 12$ 25. $c > 3$

Big Idea of the Chapter

Understand Graphs of Linear Equations

The graph of a linear equation is a line. If the line is not vertical, then it has a slope. If the slope is positive, the line rises to the right. If the slope is negative, the line falls to the right.

The equation $d = 90 - 15t$ represents the depth d (in feet) of a scuba diver t minutes after beginning an ascent to the surface. A diver must gauge the rate of the ascent to prevent decompression sickness. A rate of 30 feet per minute is common, but many divers prefer to ascend more slowly.



- How long does it take the scuba diver to reach the surface?
- How can you find the ascent time algebraically?

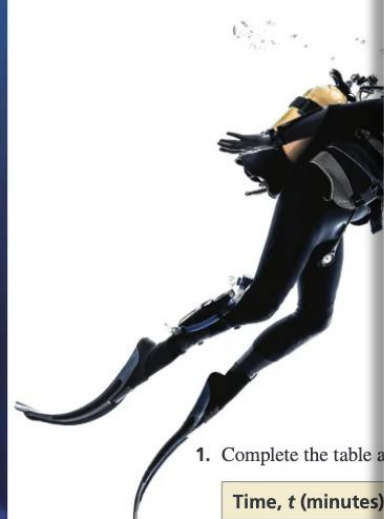


Big Idea of

Understand Graphs

The graph of a linear equation is a line. If the slope is positive, the line rises to the right.

The equation $d = 90 - 15t$ represents the depth of a diver beginning an ascent to the surface. A diver with decompression sickness. A rate of 30 feet per minute ascend more slowly.



1. Complete the table below.

Time, t (minutes)
2. How long does it take to reach the surface?
3. How can you find the depth of the diver at any time?



RESOURCES

Family Letter: Introducing

Chapter 1 Solving Linear Equations

What We're Learning...

At the beginning of this chapter, you will learn how an **Ecologist** uses math and the *Big Idea of the Chapter: Reason about Relationships.*

Family Activities and In

Solving equations is an important skill in the classroom, but how about in everyday life? Consider how you may use this skill.

Consider the following scenario:

- You and your family want to purchase a new game system. The system costs \$400. You have \$250 saved to put toward the purchase. How much more money do you still need to purchase the system?

You could simply subtract \$250 from \$400 to find the amount of money left to save, which can be represented by the equation $y + 250 = 400$ where y is the unknown value.

Now, as a family, brainstorm ways you could solve this problem working together? Or will you divide the problem among the members of your family?

Next, write an equation for each scenario. How are they different? Is the value of the variable the same?

In Chapter 1, your child will learn how to solve these equations together other ways you as a family can realize it.

Carta de la familia: Introduciéndolo al capítulo

Capítulo 1 Resolviendo ecuaciones lineales



RECURSOS

Lo que estamos aprendiendo...

Al inicio de este capítulo, su estudiante aprende cómo una **ecóloga** utiliza las matemáticas y luego explora *La gran idea del capítulo: Razonar sobre las relaciones lineales.*

Actividades e investigaciones en familia

Resolver ecuaciones es una destreza importante en el salón de clases de matemáticas, pero ¿y en la vida diaria? ¿En algún momento ha considerado que puede utilizar esta destreza en la vida real?

Considere los siguientes escenarios:

- Es posible que su familia y usted quieran comprar un nuevo sistema de videojuegos. El sistema cuesta \$400. Usted tiene ya \$250 ahorrados para el sistema. ¿Cuánto dinero tiene que ahorrar todavía para comprar el sistema?

Simplemente, puede restar \$250 de \$400 para obtener su respuesta a la ecuación en su lugar. ¿Cómo se vería eso? Lo desconocido es la cantidad de dinero que debe ahorrar se puede representar por una variable. Un ejemplo de una ecuación es $y + 250 = 400$ donde y es un valor desconocido sobre cómo encontraría el valor desconocido.

Ahora, como una familia, hagan una lluvia de ideas sobre las formas en las que podrían ahorrar el dinero. ¿Ahorrarán el dinero trabajando juntos? ¿O dividirán la cantidad que se necesita ahorrar entre los miembros de su familia y trabajarán independientemente?

Después, escriban una ecuación para cada escenario. ¿En qué se parecen las ecuaciones? ¿En qué se diferencian? ¿Es el valor de la variable el mismo para ambos escenarios?

En el capítulo 1, su hijo aprenderá cómo resolver tipos de ecuaciones semejantes. Compartan juntos otras formas en las que ustedes como una familia utilizan las ecuaciones en la vida diaria, tal vez sin siquiera saberlo.

Vocab

ecuación
exa
ecu
solu
fórm
iden
ecu
ecu
pre
pro
tas
raz



RESOURCES



WITH NATIONAL GEOGRAPHIC EXPLORERS

WITH NATIONAL GEOGRAPHIC EXPLORERS



of things living around this
complex matrix of coral.

3

Graphing Linear Functions

- 3.1 Functions
- 3.2 Characteristics of Functions
- 3.3 Linear Functions
- 3.4 Function Notation
- 3.5 Graphing Linear Equations in Standard Form
- 3.6 Graphing Linear Equations in Slope-Intercept Form
- 3.7 Transformations of Linear Functions
- 3.8 Graphing Absolute Value Functions



NATIONAL GEOGRAPHIC EXPLORER

Rhian G. Waller

MARINE SCIENTIST



Dr. Rhian Waller is Senior Lecturer at the University of Gothenburg in Sweden. She has led scuba diving expeditions to some of the most remote locations in the world. Dr. Waller specializes in the ecology of cold-water organisms, with a passion for the conservation of deep-sea and polar ecosystems.

- What are some examples of deep-sea or cold-water organisms?
- What can scuba divers learn by studying some of the least accessible locations on the planet?
- How might scuba divers use mathematics when planning a diving expedition?

PERFORMANCE TASK

Divers must be sure that their scuba tanks provide enough oxygen for their dives. In the Performance Task on pages 176 and 177, you will plan a dive by selecting a tank size, depth, and the amount of time you will spend underwater.



RESOURCES

Scuba Diving



Math & YOU Alg 1

*Screens are in active testing and development and are subject to change.



Home



Table of Contents



Assignments



Gradebook



Reports



Notes & Bookmarks



Groups



Help



View as Student



Sign Out



Cengage

Table of Contents

Audience

SELECTED (0) ▾



Show Hidden



Alg 1: Chapter 1: Solving Linear Equations



Resources



Solving Linear Equations: TE/IG



3 RESOURCES ▾



Water Conservation: SE



Water Conservation: Spanish

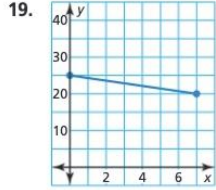
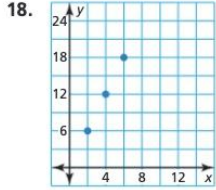


National Geographic Explorer



Family Letter: Solving Linear Equations

Find the domain of the function represented by the graph. Determine whether the domain is *discrete* or *continuous*.



Determine whether the domain is *discrete* or *continuous*.

20.

Input Time (hours), x	3	6	9
Output Distance (miles), y	150	300	450

21.

Input Relay teams, x	0	1	2
Output Athletes, y	0	4	8

22. **GARDENING** You sell baskets of tomatoes from your garden. The linear function $t = 96 - 16b$ represents the number t of tomatoes remaining in your garden after you pick b baskets of tomatoes. (See Example 4.)

- Find the domain of the function. Is the domain *discrete* or *continuous*?
- Graph the function using its domain.

23. **CONNECTION TO REAL LIFE** You fill a swimming pool with water at a rate of 17 gallons per minute. (See Example 5.)

- Find the domain of the function. Is the domain *discrete* or *continuous*?
- Graph the function using its domain.

24. **SCUBA DIVER OXYGEN TANK** The amount of air in a scuba diving tank with a capacity of 2,400 liters is decreasing at a rate of 48 liters per minute.

- Is the amount of air in the tank a function of the number of minutes?
- Find the domain of the function. Is the domain *discrete* or *continuous*?
- Graph the function using its domain.

25. **SMP.7** Complete the table so it represents a linear function.

x	5	10	15	20	25
y	-1				11



3

Graphing Linear Functions

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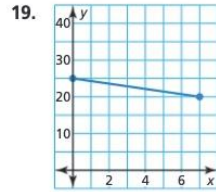
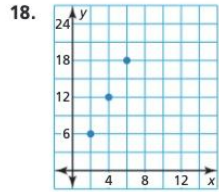


RESOURCES

Scuba Diving



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3

Graphing Linear Functions

- Functions
- Characteristics of Functions
- Linear Functions
- Function Notation



PERFORMANCE TASK Scuba diving tanks provide enough air for divers. In the Performance Task on pages 176 and 177, you will plan a dive by selecting a tank size, depth, and the amount of time you will spend underwater.



Scuba Diving

INTO THE DEEP!

Scuba tanks come in several sizes and are filled with compressed air. The table shows the capacities of several tanks compressed to pressures of 200 bar or 300 bar.

		TANK SIZE			
		10 L	12 L	15 L	18 L
COMPRESSION	200 bar	2,000 L	2,400 L	3,000 L	3,600 L
	300 bar	3,000 L	3,600 L	4,500 L	5,400 L

scuba means:

Self
Contained
Underwater
Breathing
Apparatus

Pressure increases 1 atmosphere (atm) for every 10-meter increase in depth.

As pressure doubles, the amount of air that you inhale with each breath also doubles.

1 atm — 0 m
2 atm — 10 m
3 atm — 20 m
4 atm — 30 m
5 atm — 40 m

The maximum depth for recreational divers is about 40 meters.

A 12-liter tank compressed to 200 bar can hold 2,400 liters of air, which lasts a beginner scuba diver about 1 hour when diving at a depth of 10 meters.

Analyzing Data

Use the information on the previous page to complete the following exercises.

1

Explain what is shown in the display. What do you notice? What do you wonder?

2

Write an equation that gives the relationship between tank size and capacity when the air is compressed to a pressure of 200 bar. Is the equation linear? If so, identify and interpret the slope and intercepts.

3

The equation $-\frac{1}{2}x + 5y = 5$ represents the pressure y (in atmospheres) at a depth of x meters. Graph the equation. Find the domain of the function. Is the domain discrete or continuous?

DIVE PLANNING

Plan a dive. Make sure to choose a tank size, a depth that you will dive to, and the amount of time that you will spend underwater. Include a graph of the amount of oxygen you will have remaining over time.

Explain how you can increase the duration of your dive. Describe how to model this change using transformations.

the domain is

1	2
4	8

on
ter



You get a raise at your part-time job. To write your raise as a percent, use the formula $p(r + 1) = n$, where p is your previous wage, r is the percent increase (as a decimal), and n is your new wage. Solve the formula for r . What is your raise written as a percent when your hourly wage increases from \$15.50 to \$17.05?

You lose track of how many 2-point baskets and 3-point baskets a team makes in a basketball game. The team misses all the 1-point baskets and still scores 54 points. The equation $2x + 3y = 54$ models the total points scored.

- a. Interpret the terms and coefficients in the equation.



The original photograph shown is 4 inches by 6 inches.

You have a frame that holds photos that are 8.5 inches by 11 inches. Explain whether you can enlarge the original photograph without cropping to fit the frame.



new



original

**HOW DO STUDENTS
TAKE PART IN
THEIR LEARNING?**

MATH & YOU



Balanced Approach to Instruction



conceptual



procedural



real world

Launch

Investigate

Key Concept

**In-Class
Practice**

**Connect to
Real Life**

A graphic consisting of a white circle with the word "Launch" in the center, surrounded by a dark blue ring that tapers to a point on the right side.

Launch

How many pairs of numbers can you think of that have a sum of 5? Make a list using ordered pairs example (2, 3)

x	y

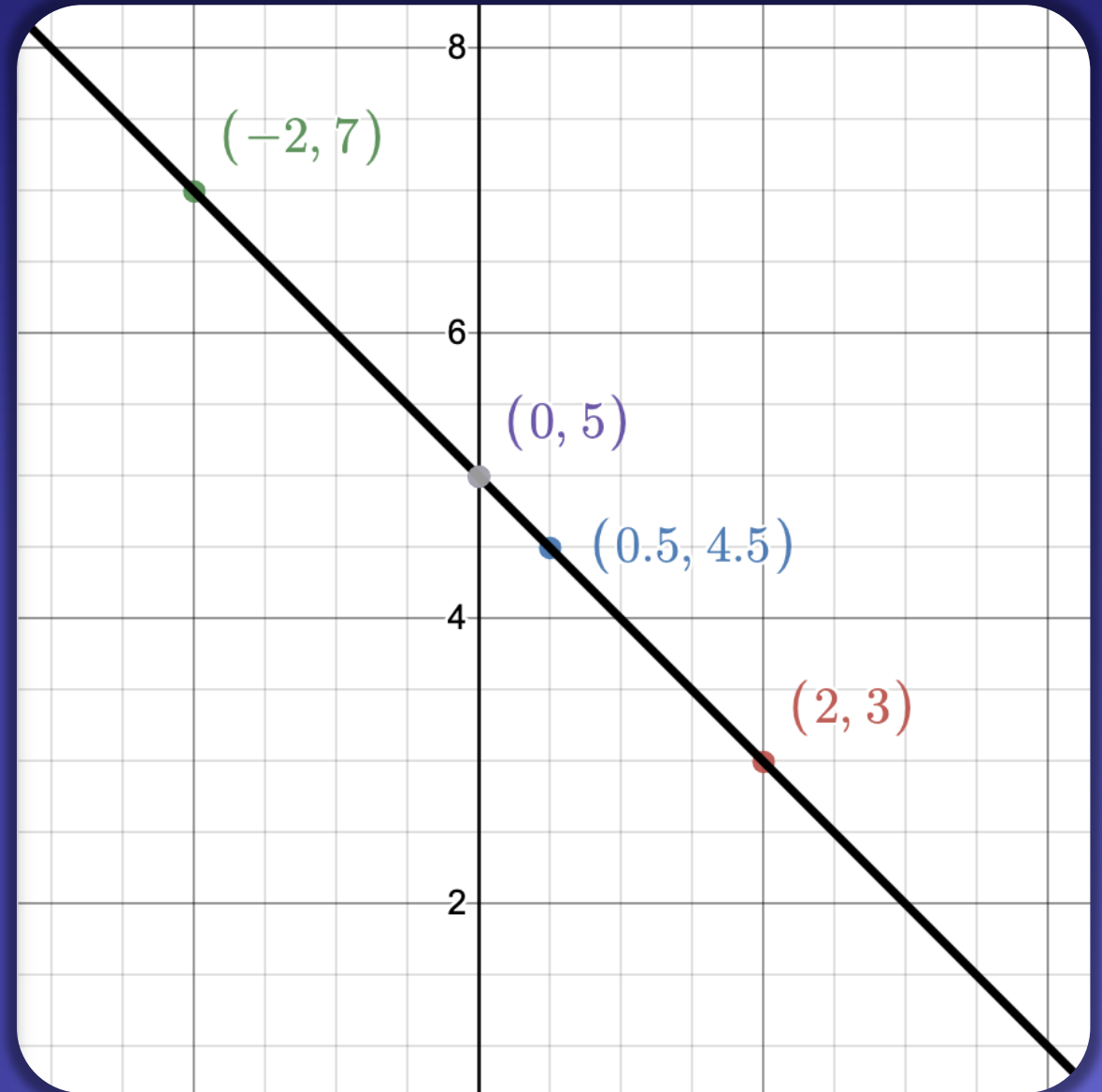
**Did you include whole
numbers? Integers?
Or Rational numbers?**

x	y
2	3
$\frac{1}{2}$	$4\frac{1}{2}$
-2	7
0	5

**Graph your list of
ordered pairs.**

**What is an
equation that
represents this
line?**

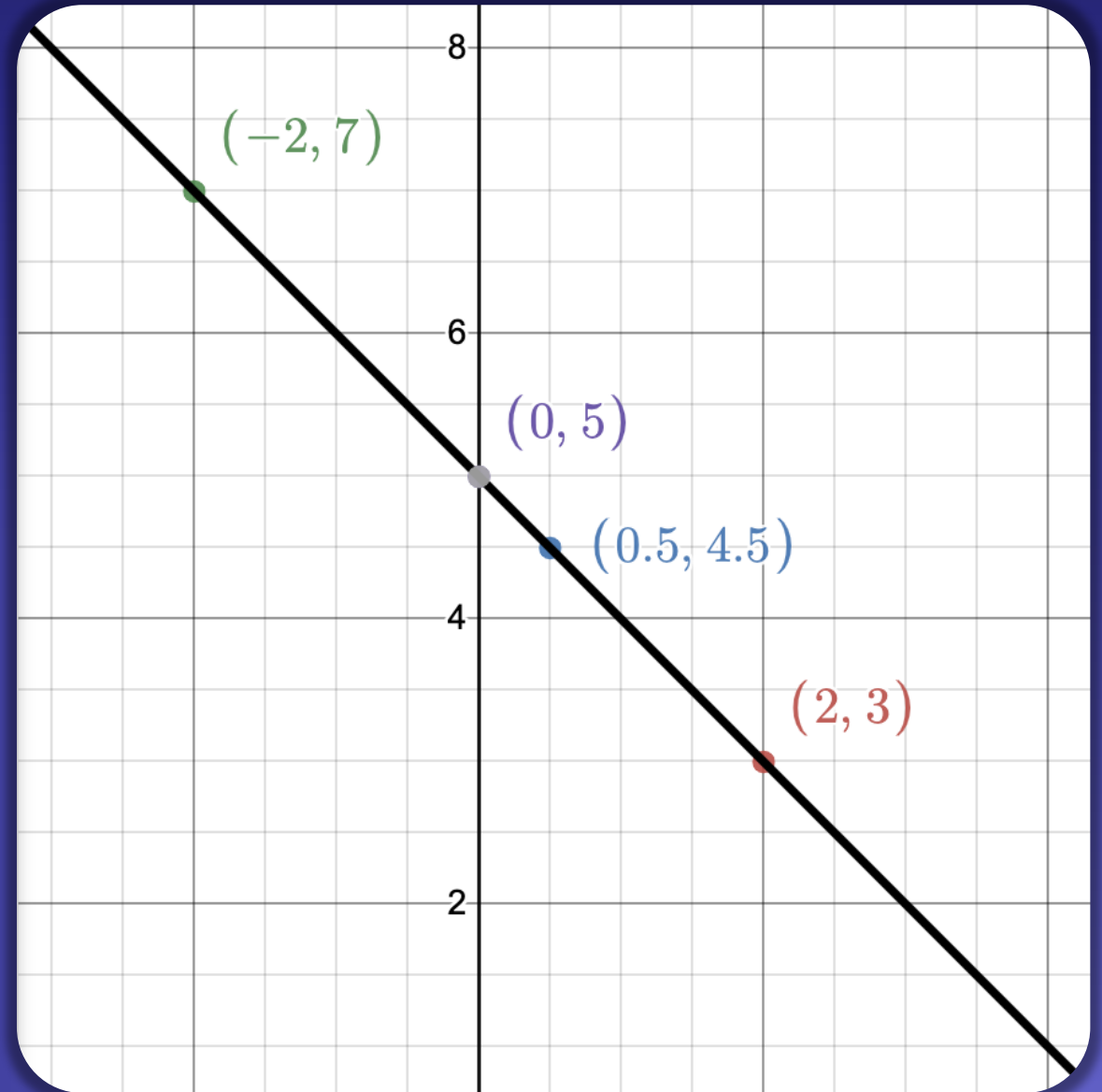
$$y = -x + 5$$



**Graph your list of
ordered pairs.**

**What is an
equation that
represents this
line?**

$$x + y = 5$$



Learning Target:

Graph and interpret linear equations written in standard form.

Success Criteria:

- Graph equations of horizontal and vertical lines.
- Graph linear equations written in standard form using intercepts.
- Solve real-life problems using linear equations in standard form.

Prerequisite Skills

- Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane. **Algebra 1 Section 3.3**
- Solve simple equations and use properties of equality to justify the solution method. **Algebra 1 Section 1.1**
- Find and interpret the slope of a line, and derive equations of proportional and linear relationships. **Grade 8 Sections 4.2–4.4**

Content Standards for Mathematics

- Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
 - Graph linear and quadratic functions and show intercepts, maxima, and minima.

WIDA English Language Development Standards

ELD-MA.9-12.Explain.Expressive Construct mathematical explanations that describe data and/or an approach used to solve a problem

ELD-MA.9-12.Argue.Interpretive Interpret concepts in arguments by distinguishing correct from flawed logic*

*See the *Answer Guide*.

Paul's Notes

Launch

Goal: Students will graph ordered pairs that represent a linear relationship and then write an equation that models the situation.

- “Make a list of pairs of numbers that have a sum of 5.” Encourage students to write the pairs of numbers as ordered pairs. For example, (2, 3).

? “Did you include numbers that are not whole numbers?” Check to see whether any students used negative or rational numbers.

- “Plot the ordered pairs in a coordinate plane and draw a line through the points.”

? “What equation represents this line?” $x + y = 5$

Talk About It

- “How do you know that $x + y = 5$ is a linear function? In this section, you will graph and interpret linear equations written in standard form. The equation $x + y = 5$ is in standard form.”

Launch

Learning Target:

Graph and interpret linear equations in standard form.

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- Understand that the graph of an equation is the set of all its solutions plotted in the coordinate plane. **Section 3.3**
- Solve simple equations and use the solution method. **Algebra 1 Section 1.2**
- Find and interpret the slope of a line. **Section 3.1**

Content Standards for Mathematics

• Create equations in two or more variables to represent

*Paul's Notes***Launch**

Goal: Students will graph ordered pairs that represent a linear relationship and then write an equation that models the situation.

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? “What equation represents this line?” $x + y = 5$

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3.5 Graphing Linear Equations in Standard Form

Investigate

Learning Target: Graph and interpret linear equations written in standard form.

- Success Criteria:**
- I can graph equations of horizontal and vertical lines.
 - I can graph linear equations written in standard form using intercepts.
 - I can solve real-life problems using linear equations in standard form.

INVESTIGATE

Using a Linear Equation in Two Variables

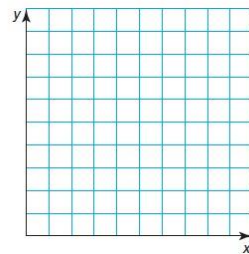
Work with a partner. You sold \$80 in tickets to a fundraiser. Adult tickets are \$4 each. Child tickets are \$2 each.

1. Write an equation that relates the number x of adult tickets and the number y of child tickets.

$$\boxed{} \cdot \text{Number of adult tickets} + \boxed{} \cdot \text{Number of child tickets} = \boxed{}$$

2. If you sold a large quantity of adult tickets, does that mean you also sold a large quantity of child tickets?
3. You lost track of how many of each type of ticket you sold. Construct a table of values to show different combinations of tickets you might have sold. Then plot the points and describe any patterns you notice.

x					
y					



4. If you know how many adult tickets you sold, can you determine how many child tickets you sold?



3.5 Graphing Linear Equations in Standard Form

Investigate

Learning Target: Graph and interpret linear equations written in standard form.

Success Criteria:

- I can graph equations of horizontal and vertical lines.
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INVESTIGATE

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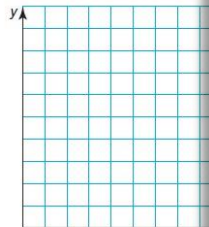
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x				
y				



4. If you know how many adult tickets you sold, how many child tickets you sold?

Work with a partner. You sold \$80 in tickets to a fundraiser. Adult tickets are \$4 each. Child tickets are \$2 each.

1. Write an equation that relates the number x of adult tickets and the number y of child tickets.

$$\frac{\boxed{}}{\text{adult}} \cdot \text{Number of adult tickets} + \frac{\boxed{}}{\text{child}} \cdot \text{Number of child tickets} = \boxed{}$$



RESOURCES



conceptual



procedural

Motivate

Investigate

Key Concept

**In-Class
Practice**

Graphing Linear Equations in Standard Form

The **standard form** of a linear equation is

$$Ax + By = C$$

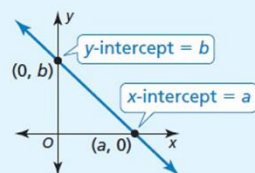
where A , B , and C are real numbers and A and B are not both zero.

Key Concept

Using Intercepts to Graph Equations

To graph $Ax + By = C$, find the intercepts and draw the line through them.

- x -intercept: Let $y = 0$ and solve for x .
- y -intercept: Let $x = 0$ and solve for y .



EXAMPLE 1 Using Intercepts to Graph a Linear Equation

Use intercepts to graph $3x + 4y = 12$.

To find the x -intercept, substitute 0 for y and solve for x .

$$\begin{aligned} 3x + 4y &= 12 && \text{Write the original equation.} \\ 3x + 4(0) &= 12 && \text{Substitute 0 for } y. \\ x &= 4 && \text{Solve for } x. \end{aligned}$$

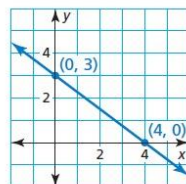
To find the y -intercept, substitute 0 for x and solve for y .

$$\begin{aligned} 3x + 4y &= 12 && \text{Write the original equation.} \\ 3(0) + 4y &= 12 && \text{Substitute 0 for } x. \\ y &= 3 && \text{Solve for } y. \end{aligned}$$

The x -intercept is 4, so plot the point $(4, 0)$.

The y -intercept is 3, so plot the point $(0, 3)$.

Draw a line through the points.



In-Class Practice

Self-Assessment

Use intercepts to graph the equation.

1. $2x - y = 4$

2. $x + 3y = -9$

3. $\frac{3}{4}x + 2y = 6$

1 I don't understand yet.

2 I can do it with help.

3 I can do it on my own.

4 I can teach someone.

Graphing Linear Equations in Standard Form

The **standard form** of a linear equation is

$$Ax + By = C$$

where A , B , and C are real numbers and A and B are not both zero.

Key Concept

Using Intercepts to Graph a Linear Equation

To graph $Ax + By = C$, find the x -intercept and the y -intercept, and draw the line through them.

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- y -intercept: Let $x = 0$ and solve for y .

EXAMPLE 1 Using Intercepts to Graph a Linear Equation

Use intercepts to graph the equation $3x + 4y = 12$.

To find the x -intercept, let $y = 0$ and solve for x .

$$3x + 4y = 12$$

$$3x + 4(0) = 12$$

$$3x = 12$$

$$x = 4$$

To find the y -intercept, let $x = 0$ and solve for y .

$$3x + 4y = 12$$

$$3(0) + 4y = 12$$

$$4y = 12$$

$$y = 3$$

The x -intercept is 4.

The y -intercept is 3.

Draw a line through the points $(4, 0)$ and $(0, 3)$.

Example 1: Using Intercepts to Graph a Linear Equation

Use intercepts to graph the equation $3x + 4y = 12$.

SOLUTION

Step 1 Find the intercepts.

To find the x -intercept, substitute 0 for y and solve for x .

$$3x + 4y = 12$$

Write the original equation.

$$3x + 4(0) = 12$$

Substitute 0 for y .

$$3x = 12$$

Solve for x .

$$x = 4$$

To find the y -intercept, substitute 0 for x and solve for y .

**Screens are in active testing and development and are subject to change.*

In-Class Practice

Self-Assessment

Use intercepts to graph the equation.

1. $2x - y = 4$

1 I don't know

Vocabulary
standard form

Graphing Linear Equations in Standard Form

The **standard form** of a linear equation is

$$Ax + By = C$$

where A , B , and C are real numbers and A and B are not both zero.

Key Concepts

Using Intercepts

To graph a line and draw the line, find the x -intercept and the y -intercept.

- x -intercept
- y -intercept

EXAMPLE 1

Using Intercepts

Use intercepts to graph the line.

To find the x -intercept, let $y = 0$ and solve for x .

$$3x + 4 = 0$$

$$3x = -4$$

To find the y -intercept, let $x = 0$ and solve for y .

$$3(0) + 4 = 0$$

$$4 = 0$$

The x -intercept is $-\frac{4}{3}$.

The y -intercept is -4 .

Draw a line through the points $(-\frac{4}{3}, 0)$ and $(0, -4)$.

In-Class Practice

Self-Assessment

Use intercepts to graph the line.

1. $2x - y = 4$

In-Class Practice

ICP: Solving Equations with Variables on Both Sides: Act Hidden Student RESOURCES

VIEW AS INSTRUCTOR VIEW AS STUDENT ACTIVITY DETAILS

1 of 4

Solve the equation.

$$-\frac{3}{4}(8n + 12) = 3(n - 3)$$

$n =$

← 1 2 3 4 NEXT →

**Screens are in active testing and development and are subject to change.*

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

4 I can teach someone.



conceptual



procedural



real world

Motivate

Investigate

Key Concept

**In-Class
Practice**

**Connect to
Real Life**

EXAMPLE 3

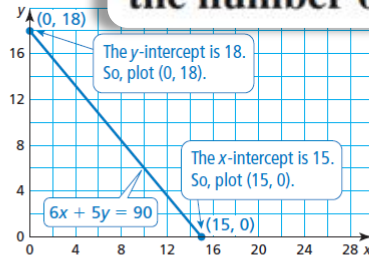
Using a Graph to Solve a Problem

A science center sells \$90 in tickets to a space shuttle simulator. General tickets cost \$6, and member tickets cost \$5. The equation $6x + 5y = 90$ models this situation, where x is the number of general tickets and y is the number of member tickets.

- a. Graph the equation. Interpret the intercepts.

Use intercepts to graph the equation. Neither x nor y can be negative, so only graph the equation in the first quadrant.

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- The x-intercept shows that 15 general tickets are sold when no member tickets are sold. The y-intercept shows that 18 member tickets are sold when no general tickets are sold.

- b. Find three possible solutions in the context of the problem.

Only whole-number values make sense in this context. Besides the intercepts, it appears that the line passes through (10, 6). Use the equation to verify that this is a solution.

$$6x + 5y = 90$$

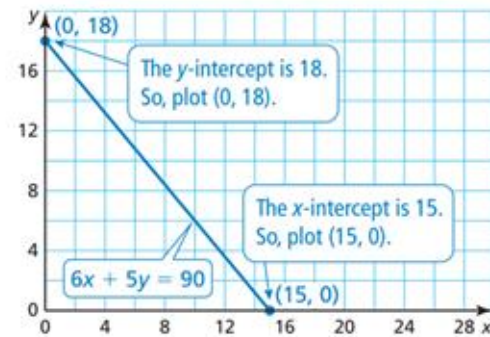
$$6(10) + 5(6) \stackrel{?}{=} 90$$

$$90 = 90 \quad \checkmark$$

- Three possible combinations are 0 general and 18 member, 15 general and 0 member, and 10 general and 6 member.

- a. Graph the equation. Interpret the intercepts.

Use intercepts to graph the equation. Neither x nor y can be negative, so only graph the equation in the first quadrant.



Connect to
Real Life

In-Class Practice

Self-Assessment

8. **SMP.2 WHAT IF?** The science center sells tickets to a different simulator. The situation is given by $8x + 7y = 112$, where x is the number of general tickets and y is the number of member tickets.
- Interpret the terms and coefficients in the equation.
 - Graph the equation. Interpret the intercepts.
 - Find three possible solutions in the context of the problem.

1 I don't understand yet.

2 I can do it with help.

3 I can do it on my own.

4 I can do it with confidence.

Paul's Notes Closure

- Exit Ticket:** "Summarize what you learned in this section by writing a note to a friend who was absent. Make sure you explain a key concept or strategy."
- See *Support for All Learners* for content support to nudge students toward mastery.

3.5 Practice

with
Calc Chat and **Calc View**

Use intercepts to graph the equation. (See Example 1.)

1. $5x + 3y = 30$

2. $4x + 6y = 12$

▶ 3. $-12x + 3y = 24$

4. $2y - x = 7$

5. $3x + 5 = y$

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

Graph the equation. (See Example 2.)

7. $x = 4$

8. $y = -3$

▶ 9. $y = \frac{1}{2}$

10. $x = -1.5$

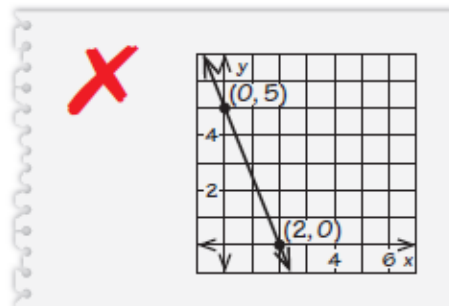
11. Are the equations of horizontal and vertical lines written in standard form? Explain.



12. **SMP.2 CONNECTION TO REAL LIFE** You rent a bicycle for \$9 or a scooter for \$5, each day. You spend a total of \$180, represented by the equation $9x + 5y = 180$. (See Example 3.)

- a. Interpret the terms and coefficients in the equation.
- b. Graph the equation. Interpret the intercepts.
- c. Find three possible solutions in the context of the problem.

13. **SMP.3 ERROR ANALYSIS** Describe and correct the error in using intercepts to graph $4x + 10y = 20$.



3.5 Practice

with
Calc Chat and **Calc View**

Use intercepts to graph the equation. (See Example 1.)

1. $5x + 3y = 30$

2. $4x + 6y = 12$

3. $-12x + 3y = 12$

4. $2y - x = 7$

Graph the equation. (See Example 2.)

7. $x = 4$

8. $y = -3$

11. Are the equations of horizontal lines parallel?

9. $y = \frac{1}{2}$

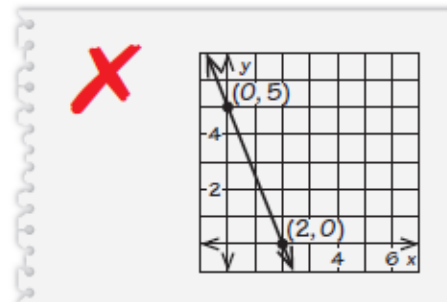
10. $x = -2$

Explain.

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Calc Chat

Calc View



RESOURCES



Practice: Solving Equations with Variables on Both Sides: Act

Hidden

Student



VIEW AS INSTRUCTOR

☒ VIEW AS STUDENT

ACTIVITY DETAILS ▾

Teacher
Tools



3 of 20

WRITING Complete the following.

Part A. Match the descriptions to the steps used in solving the linear equation $3(3x - 8) = 4x + 6$.

$$9x - 24 = 4x + 6 \rightarrow$$

$$5x - 24 = 6 \rightarrow$$

$$5x = 30 \rightarrow$$

$$x = 6$$

⌘ Subtract $4x$ from each side.

⌘ Divide each side by 5.

⌘ Use the Distributive Property.

⌘ Divide each side by 3.

⌘ Add 24 to each side.

⌘ Add 6 to each side.

⌘ Subtract 24 from each side.24

**Screens are in active testing and development and are subject to change.*



Assignment Report - Chapter 1: Quiz

Last updated: December 4, 2023 at 8:14 PM EST



VIEWING DATA FOR

Classes

3

Students

20



STUDENT PERFORMANCE

Avg. score

72%

Avg. time on task

28 min.



BENCHMARK



District avg. score

88%



GRADING POLICY

Attempt shown

Last

OVERVIEW

STANDARDS

QUESTIONS

STUDENTS

Performance by Question

Legend Correct Partially Correct Incorrect Not Graded

? BY QUESTION

BY CLASS/STUDENT

#	Question	Standards	Avg. Score	Student Responses
1	Which of these is a quadrilateral?	2 STANDARDS	90%	18 2 0 0
2	A square has four sides that are equal and four right an...	2 STANDARDS	100%	10 9 1 0
3	A rectangle is made of 4 rows with 5 unit squares in ea...	2 STANDARDS	80%	10 7 3 0

*Screens are in active testing and development and are subject to change.

Name _____

Algebra 1 Chapter 1 Chapter Test

1 Solve $m - 1 = -5$.

Solution: $m =$ _____

2 Solve $\frac{d}{6} = 3$.

Solution: $d =$ _____

3 Solve $4(x - 4) - 2 = -2$.

Solution: $x =$ _____

4 Solve $|2x - 7| + 3 = 12$.

Solutions: $x =$ _____ and $x =$ _____

5 The letters a and b represent nonzero constants.

$x =$ _____

6 You are 5 feet 4 inches tall and cast a shadow 2 feet long. A utility pole casts a shadow 19 feet 6 inches long.

The height of the utility pole is _____ feet.



Name _____

Algebra 1 Chapter 1 Chapter Test

1 Solve $m - 1 = -5$.

Solution: $m =$ -4

2 Solve $\frac{d}{6} = 3$.

Solution: $d =$ 18

3 Solve $4(x - 4) - 2 = -2$.

Solution: $x =$ 4

4 Solve $|2x - 7| + 3 = 12$.

Solutions: $x =$ -1 and $x =$ 8

5 The letters a and b represent nonzero constants. Solve

$$x = \frac{-b + 50}{a}$$

6 You are 5 feet 4 inches tall and cast a shadow 2 feet long. A utility pole casts a shadow 19 feet 6 inches long. Find the

The height of the utility pole is 52 feet.

Algebra 1 Chapter 1 Chapter Test: Act

Hidden

Student

☒ VIEW AS INSTRUCTOR

VIEW AS STUDENT

Teacher
Tools

1 of 15

Solve $m - 1 = -5$

Solution:

Correct answers:

2 of 15

Complete the following.

Part A. The volume of a prism is given by the formula $V = lwh$, where l is the length of the prism and h is the height of the prism.Solve the formula for w .



VIEWING DATA FOR

Classes

Students

3

20



STUDENT PERFORMANCE

Avg. score

Avg. time on task

72%

28 min.



BENCHMARK



District avg. score

88%



GRADING POLICY

Attempt shown

Last

OVERVIEW

STANDARDS

QUESTIONS

STUDENTS

Standards Overview

Highest Performing Standards

97%

[MA.3.GR.1.1](#)

Identify and describe quadrilaterals, including parallelograms, rectangles, squares, rhombuses and trapezoids, based on the presence or absence of parallel or perpendicular lines.

95%

[MA.3.GR.1.2](#)

Classify quadrilaterals based on the presence or absence of parallel or perpendicular lines or the presence or absence of angle types.

92%

[MA.3.GR.1.3](#)

Partition shapes into equal parts with equal areas and express the area of each part as a unit fraction of the whole.

Lowest Performing Standards

40%

[MA.3.GR.2.1](#)

Find the area of a figure composed of rectangles by decomposing it into non-overlapping rectangles and applying the area formula.

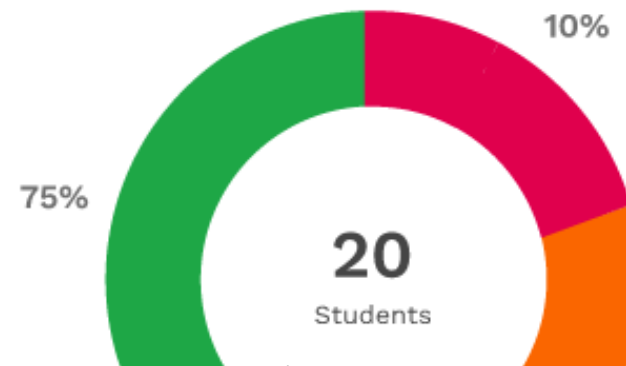
Performance by Standard

[How is Standards Performance calculated?](#)

Standard



MA.6.AR.1.1



*Screens are in active testing and development and are subject to change.

TEACHER



Performance by Standard

By Class

By Standard

Filter by Standard

All Standards

Standards Strand	The Real Number System (N-RN)				Quantities (N-Q)				
Standard Code	N-RN.A.1	↕	N-RN.A.2	↕	N-Q.A.1	↕	N-Q.A.2	↕	N-Q.A.3
Class ↓	77%		80%		81%		87%		65%
Alvarez, Maria: Period 1A	75.8%		82.9%		77.5%		84.3%		55%
Alvarez, Maria: Period 1B	80%		98%		60%		80%		95%
Alvarez, Maria: Period 1C	96%		100%		90%		90%		91%
Benton, Thomas - Period 1A	86%		100%		85%		100%		90%
Chen, Emily - Period 2A	100%		70%		96%		86%		90%
Diaz, Carlos - Course 3B	100%		95%		98%		100%		65%

DISTRICT



CAMPUS



Activity Performance Details						
Legend Correct Partially Correct Incorrect Not Graded Not Submitted						
By Question		By Class/Student		Filter by Group		Filter by Performance
				Select a Group		Select Performance Group
Class ↕	# Students ↕	Avg. Time on Task	Avg. Activity Score			
Alvarez, Maria: Period 1A	8	32.6m	75.8%			
Student ↕	Submitted	Attempts	Time on task ↕	Score ↕	Groups	
Abercromby, Andrew	6/5/25 9:58AM ET	1 of 1	60m	80%	High Achievers	+
Benitez, Tamara	6/5/25 2:14PM ET	1 of 2	14m	60%	+ Add To Group	
Colak, Goran	6/6/25 10:24AM ET	2 of 2	55m	40%	Needs Reteach	+

Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.		
Central Tech Academy	53%	View Report
Edison High	53%	View Report
Hamilton Trade School	72%	View Report
Jefferson Tech HS	48%	View Report
Kennedy CTE Academy	68%	View Report
Liberty Career Center	44%	View Report
Monroe Vocational	34%	View Report
Roosevelt HS	53%	View Report
N-RN.A.2	50% 2 Questions	Find Content
Rewrite expressions involving radicals and rational exponents using the properties of exponents.		
Quantities (N-Q)	43%	
Algebra (A)	62%	

**HOW DO YOU
IMPACT STUDENT
LEARNING?**

The Big Picture of the Big Idea



instruction



implementation



partnership

Co-Author Insights

Paul's Notes

Overview

What we're doing...

This chapter is about polynomial equations and factoring. Throughout the chapter, an emphasis is placed on the structures of expressions and equations.

Why we're doing it...

This chapter provides opportunities for students to continue to develop their ability to look for and make use of structure. This mathematical practice is paramount to a successful mathematics experience. In the next chapter, students will make connections between

Essential Background

Students will apply their knowledge of properties of exponents to multiply and divide polynomials. They should also have familiarity with greatest common factor.



Paul's Insights

Listen to Paul talk about how this chapter fits in with your students' learning progressions.



Becky Ramirez



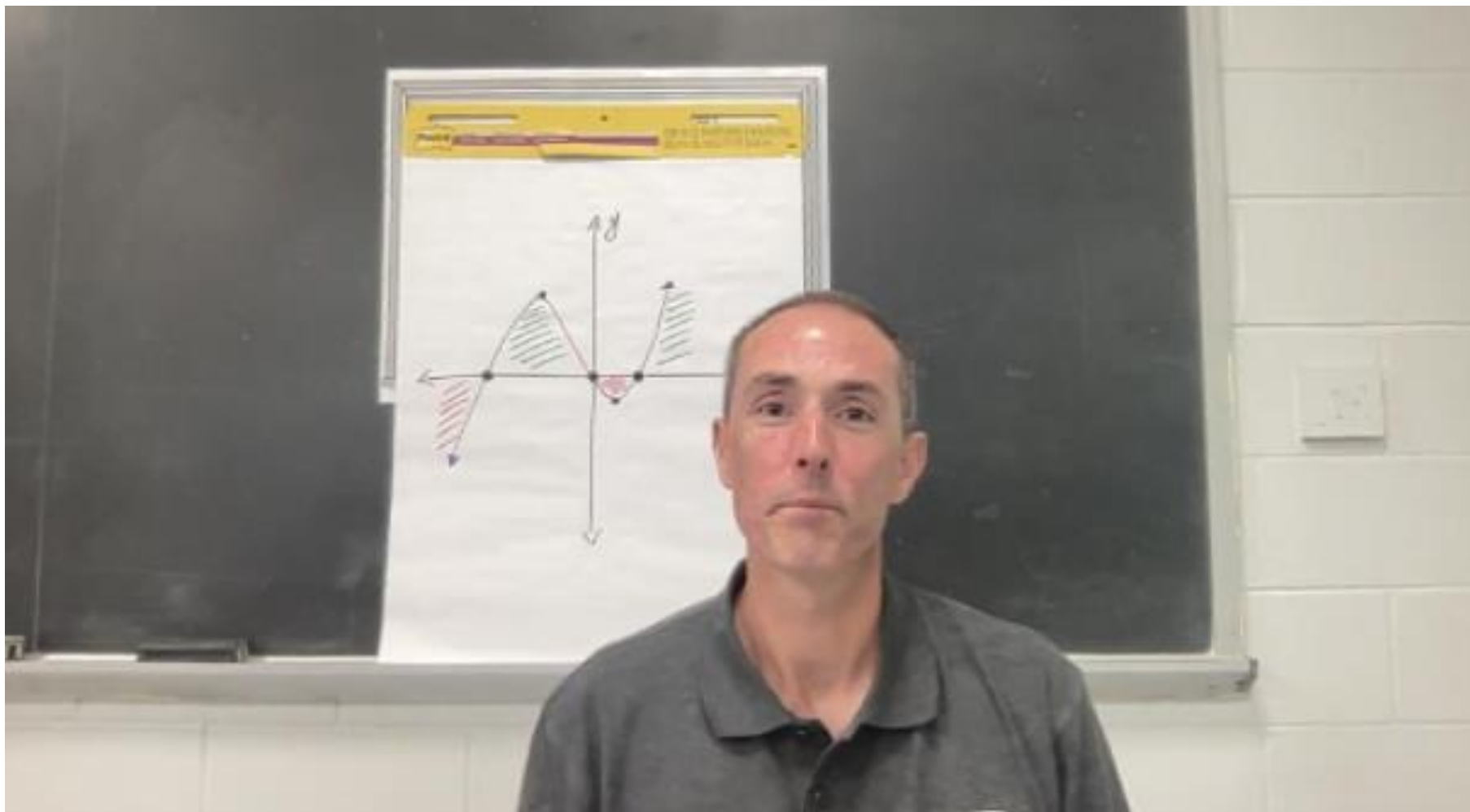
Algebraic Expressions and Properties: TE

Teacher

RESOURCES



Teacher
Tools



ACCELERATE LEARNING

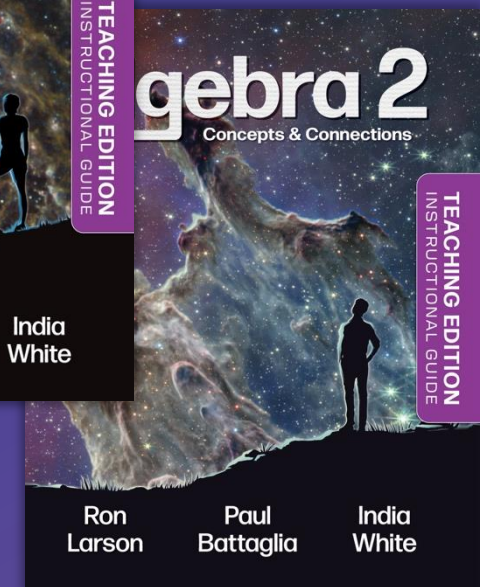
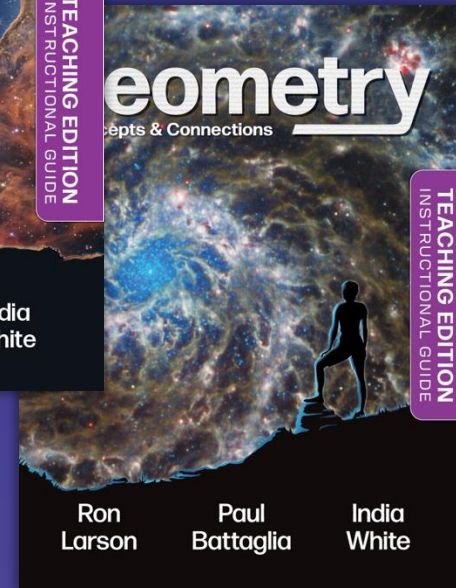
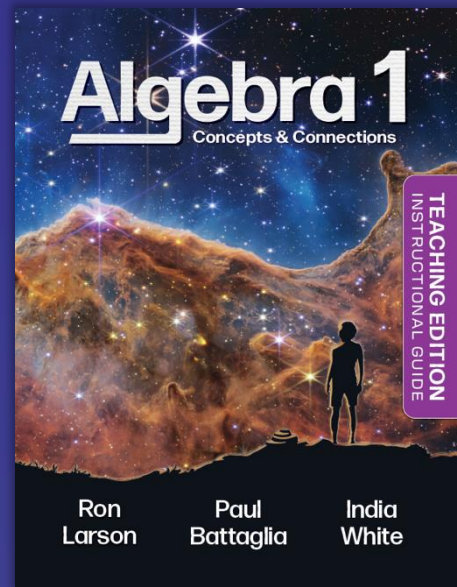


2 YEARS GROWTH



FEEDBACK
CLASS DISCUSSION
TEACHER CLARITY

EXPLORE the Teaching Edition



7.2 Multiplying and Dividing Polynomials

Learning Target:

Multiply and divide polynomials.

Success Criteria:

- Multiply and divide polynomials by monomials.
- Multiply binomials using the Distributive Property.
- Multiply binomials using the FOIL Method.
- Multiply binomials and trinomials.

Prerequisite Skills

Use properties of integer exponents to generate equivalent expressions. **Grade 8 Sections 8.2–8.5**

Content Standards for Mathematics

Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

WIDA English Language Development Standards

ELD-MA.9-12.Argue.Expressive Construct mathematics arguments that justify (and refute) conclusions with evidence and mathematical principles

ELD-MA.9-12.Explain.Expressive Construct mathematical explanations that share solutions with others

Paul's Notes

Launch

Goal: Students will use the Distributive Property to multiply polynomials.

? “Use mental math to multiply 8×32 .” **256** Ask students to explain how they found their answer. If no one mentions using the Distributive Property, ask, “How can you use the Distributive Property to find the product?” $8 \times 32 = 8(30 + 2) = 240 + 16 = 256$

? “How can you use the Distributive Property to expand the expression $5(3x + 4)$? the expression $5x^2(3x + 4)$?” Have students identify similarities and differences between these expressions.

? Display the equation $3x^2(\underline{\hspace{1cm}} + 5) = 12x^3 + \underline{\hspace{1cm}}$. “Work with a partner to complete the equation. How can you determine the degree of each missing term?” Listen for students to mention using the Distributive Property and properties of exponents.

Talk About It

- 🕒 “In each of these problems, you multiplied a monomial by a binomial using the Distributive Property. In this section, you will also learn how to use the Distributive Property to multiply binomials and to multiply binomials and trinomials.”

Use **Quick Check** exercises to quickly identify where students are in their learning.

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WIDA English

ELD-MA.9-12.Arg arguments that justify and mathematical

ELD-MA.9-12.Exp explanations that

Paul's Notes Launch

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Paul's Notes Launch

Goal: Students will use the Distributive

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Use **Quick Check** exercises to quickly identify where students are in their learning.

Classifying Polynomials

- It is important to emphasize the ability to classify polynomials. Identifying a polynomial by its degree will assist students in specifying key features of the graphs of polynomial functions (such as the number of extrema or the maximum number of zeros) in future mathematics courses.
- Common Error:** Many students mistakenly identify the coefficient of the first term as the leading coefficient without associating it with the degree of the polynomial. Example 2 is good for identifying this mistake, as the polynomial is not written in standard form.
- SMP.7** "Your friend says the polynomial $3x^3 - 5x^4$ has a degree of 7. Do you agree? Explain your reasoning."
- Ask students to write a polynomial in standard form that satisfies each of the following conditions.
 - a binomial
 - degree of 4
 - negative leading coefficient

Talk About It

- "Do you feel comfortable classifying polynomials, or do you need more examples?"
- Have students complete Exercises 4–6 independently and then share their answers with a partner. Discuss as a class.

Adding and Subtracting Polynomials

- Dig Deeper:** "Is the sum or difference of two polynomials always a polynomial? Explain." Discuss what it means for a set to be *closed* under an operation. Give an example of a set that is not closed under an operation. For example, whole numbers are *not* closed under subtraction (e.g., $4 - 6 = -2$).
- Explain that when adding and subtracting polynomials, a vertical or horizontal method can be used, similar to whole-number operations.
- Consider showing students how to use a placeholder when expressions do not have the same number of terms. For instance, in Example 5, the binomial expression does not have a linear term, so students may benefit from writing $0x$.

Talk About It

- Turn and Talk:** "Which method, vertical or horizontal, do you prefer to use to add polynomials? to subtract polynomials? Explain why you chose each method. Are there any types of problems that you may want to solve using a different method? Explain your reasoning."

Classifying Polynomials

Key Concept

Polynomial
A polynomial is an expression of the form $a_n x^n + a_{n-1} x^{n-1} + \dots + a_1 x + a_0$, where $a_n, a_{n-1}, \dots, a_1, a_0$ are real numbers and n is a nonnegative integer. A polynomial with one term is a monomial, a polynomial with two terms is a binomial, and a polynomial with three terms is a trinomial.

Example 1
Classify the polynomial by the number of terms.
The polynomial $3x^2 + 5x - 12$ has three terms. It is a trinomial.

Example 2
Write the polynomial in standard form. Identify the degree and leading coefficient. Then classify the polynomial by the number of terms.
The polynomial $-4x^3 + 2x^2 + 7x - 1$ is in standard form. The degree is 3, and the leading coefficient is -4 . It is a polynomial with four terms. It is a quartic polynomial.

Example 3
Classify the polynomial by the number of terms.
The polynomial $5x^2 - 3x + 1$ is in standard form. It has three terms. It is a trinomial.

In-Class Practice
Write the polynomial in standard form. Identify the degree and leading coefficient of the polynomial. Then classify the polynomial by the number of terms.

1. $2x^3 + 5x^2 - 1$ 2. $4x^2 - 3x + 7$ 3. $6x^4 - 2x^3 + 9x^2 - 1$ 4. $3x^2 + 5x - 12$

- SMP.7** "Why is it helpful to write polynomials in standard form? How might standard form make it easier to add or subtract polynomials?"

Talk About It

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In-Class Practice
Write the polynomial in standard form. Identify the degree and leading coefficient of the polynomial. Then classify the polynomial by the number of terms.

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Student Edition page 358

Quick Check Exercises 7 and 8

Classifying Polynomials

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Talk About It

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- Have students complete Exercises 4–6 independently and then share their answers with a partner. Discuss as a class.

Adding and Subtracting Polynomials

- ?** **Dig Deeper:** "Is the sum or difference of two polynomials always a polynomial? Explain." Discuss what it means for a set to be *closed* under an operation. Give an example of a set that is not closed under an operation. For example, whole numbers are *not* closed under subtraction (e.g., $4 - 6 = -2$).
- Explain that when adding and subtracting polynomials, a vertical or horizontal method can be used, similar to whole-number operations.
 - Consider showing students how to use a placeholder when expressions do not have the same number of terms. For instance, in Example 5, the binomial expression does not have a linear term, so students may benefit from writing 0.

Talk About It

- Turn and Talk:** "Which method, vertical or horizontal, do you prefer to use to add polynomials? to subtract polynomials? Explain why you chose each method. Are there any types of problems that you may want to solve using a different method? Explain your reasoning."

Classifying Polynomials

Key Concept

Polynomial
A polynomial is an expression of the form $a_n x^n + a_{n-1} x^{n-1} + \dots + a_1 x + a_0$, where $a_n, a_{n-1}, \dots, a_1, a_0$ are real numbers and n is a nonnegative integer. A polynomial can be written in standard form.

Example 1
Classify the polynomial by the number of terms and the degree.
 $3x^2 + 5x - 7$
The polynomial has 3 terms and degree 2. It is a trinomial of degree 2.

Example 2
Classify the polynomial by the number of terms and the degree.
 $-4x^3 + 2x^2 - 5x + 1$
The polynomial has 4 terms and degree 3. It is a quartic of degree 3.

Example 3
Classify the polynomial by the number of terms and the degree.
 $5x^4 - 3x^3 + 2x^2 - 7x + 1$
The polynomial has 5 terms and degree 4. It is a quintic of degree 4.

In-Class Practice
Write the polynomial in standard form. Identify the degree and leading coefficient of the polynomial. Then classify the polynomial by the number of terms.
1. $2x^3 - 5x^2 + 3x - 7$
2. $-4x^4 + 2x^3 - 5x^2 + 1$
3. $5x^5 - 3x^4 + 2x^3 - 7x^2 + 1$

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Quick Check Exercise 5

Quick Check Exercise 5

In-Class Practice

Self-Assessment

Write the polynomial in standard form. Identify the degree and leading coefficient of the polynomial. Then classify the polynomial by the number of terms.

4. $4 - 9z$

5. $t^2 - t^3 - 10t$

6. $2.8x + x^3$

1 I don't understand yet.

2 I can do it with help.

3 I can do it on my own.

4 I can teach someone.

Example 4
Subtracting Polynomials
Find $(4x^2 + 3x - 7) - (2x^2 + 5x - 1)$.
Align like terms vertically and subtract.
$$\begin{array}{r} 4x^2 + 3x - 7 \\ -(2x^2 + 5x - 1) \\ \hline 2x^2 - 2x - 6 \end{array}$$

The difference is $2x^2 - 2x - 6$.

In-Class Practice
Find the sum or difference.
1. $(3x^2 + 2x - 5) + (x^2 - 4x + 8)$
2. $(4x^3 - 3x^2 + 2x - 1) - (2x^3 + 5x^2 - 3x + 4)$

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Quick Check Exercises 7 and 8

Investigate

Goal: Students will add and subtract polynomials using manipulatives.

- The shapes of algebra tiles are a visual clue that when you add $2x^2$ and $3x$, you do not get $5x^2$. The shapes are different, so they are not like terms and you cannot combine them by addition or subtraction. Mathematically proficient students see that $2x^2 + 3x$ means you have 2 of something (x^2 -term) being added to 3 of something different (x -term).
- Students may have prior experience with using algebra tiles to add and subtract linear expressions. You may want to review addition and subtraction of constant terms and variable terms with algebra tiles.
- Exercise 1(a):** Students can find the sum by “pushing together” the expressions, grouping like terms (like tiles), and removing zero pairs.
- Do not allow students to say, “A positive and negative cancel each other (or cancel out).” Encourage them to refer to the Additive Inverse Property, $a + (-a) = 0$. a and $-a$ represent a *zero pair*.
- Ask a volunteer to model the sum in Exercise 1(a) and write an equation to represent the sum: $(3x + 2) + (x - 5) = 4x - 3$.
- “Do you think the sum of two binomials is always a binomial?” Students should be able to give examples for which the sum is not a binomial.
- When finding a difference, students can use algebra tiles to represent the first polynomial in a common workspace and then find the difference by removing the tiles of the second polynomial from the first polynomial. For the last difference, students will need to add zero pairs to subtract the polynomials.
- Alternatively, you can prompt students to represent differences as sums by asking, “How do you subtract an integer?” **Add its opposite.** This question will guide students to change the subtraction symbol to an addition symbol and flip each tile in the subtrahend (or swap tiles if they are not two-sided).

Talk About It

- “In the Investigate, you used algebra tiles to add and subtract polynomials. Perhaps this is familiar from your work with algebra tiles in middle school. In the lesson, you will continue working with polynomials, and additional vocabulary associated with polynomials will be introduced.”

Differentiating Instruction

- Emerging:** Allow the opportunity for students to continue working with algebra tiles before attempting Examples 4 and 5, so they can see the connection to combining like terms. Have students practice writing expressions before and after finding the sum or difference. Start with binomials and then progress to trinomials.
- Proficient:** Students are familiar with representing addition and subtraction vertically and horizontally. Some students may even be comfortable performing the operations mentally.

7.1 Adding and Subtracting Polynomials

Learning target: Add and subtract polynomials.

Success criteria:

- I can identify polynomials.
- I can add and subtract polynomials.
- I can model adding and subtracting polynomials using algebra tiles.

A monomial is a number, a variable, or the product of a number and one or more variables with whole number exponents. A polynomial is a sum of monomials.

INVESTIGATE Adding and Subtracting Polynomials

Work with a partner. Use algebra tiles to find sums and differences of polynomials.

1. Write each expression in the box below. Then use algebra tiles to find each sum or difference.

A. $(3x + 2) + (x - 5)$

B. $(3x + 2) - (x - 5)$

C. $(3x + 2) + (x - 5) - (x - 5)$

2. Explain how you added and subtracted polynomials without using algebra tiles.

3. Write an equation to represent the sum or difference.

4. Write an equation to represent the sum or difference.

Student Edition

Differentiating Instruction

- Emerging:** Allow the opportunity for students to continue working with algebra tiles before attempting Examples 4 and 5, so they can see the connection to combining like terms. Have students practice writing expressions before and after finding the sum or difference. Start with binomials and then progress to trinomials.
- Proficient:** Students are familiar with representing addition and subtraction vertically and horizontally. Some students may even be comfortable performing the operations mentally.

Connections to Real Life

Modeling Real Life
A red water balloon is thrown straight down from a height of 200 feet. As it falls, a blue water balloon is dropped from a height of 100 feet. The equations represent the height (in feet) of the balloons after t seconds.

$r(t) = -16t^2 + 200$
 $b(t) = -16t^2 + 100$

• Which polynomial best represents the distance between the water balloons after t seconds?
The function that represents the distance between the water balloons after t seconds is $d(t) = 100$.

Real Balloons
Red Balloons: $-16t^2 + 200$
Blue Balloons: $-16t^2 + 100$

• Time elapsed: $t = 0$ to $t = 2.5$ seconds. The distance between the water balloons after t seconds is $d(t) = 100$.

• Interpreting coefficients and constants of the polynomial in part (a).
The function that represents the distance between the water balloons after t seconds is $d(t) = 100$.

In-Class Practice
16. The client's height (in feet) is $h(t) = -16t^2 + 64t + 64$. The client's height (in feet) is $h(t) = -16t^2 + 64t + 64$. The client's height (in feet) is $h(t) = -16t^2 + 64t + 64$. The client's height (in feet) is $h(t) = -16t^2 + 64t + 64$.

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Quick Check Exercise 9

My Thoughts on the Lesson

Go online to reflect on this lesson. How did you support student learning? What worked? What didn't work? What would you do differently?

Paul's Notes

Connections to Real Life

- Interpret the meaning of the polynomial in part (a). Notice that each term of the resulting expression has special meaning in the context of the problem.
- In Example 6, consider showing a graph of the functions on the same plane. Have students point out the distance between the water balloons on the graph.

India's Notes

SEL Connection

Help build your students' **Social Awareness** skills by discussing types of sports that include people with physical disabilities.

- ? "What sports can a person with physical disabilities participate in?"
- ? "What are some ways you can promote inclusion for people with physical disabilities during gym class?"

EL English Learner Support

Interpreting Mathematical Explanations

Review this section's vocabulary terms and concepts using summary triangles. Typically, a summary triangle is divided into 3 or 4 parts. Students should write the concept in the top part. Then students can write related categories in the middle part(s). Related categories may include procedure, explanation, description, etc. In the bottom part, students write an example to illustrate the concept. Students may also place their summary triangles on note cards to use as a quick study reference. Support EL students in the following ways.

Entering–Emerging: Assign one term or concept to a small group of students and have them complete a summary triangle. Provide feedback, and have students complete additional summary triangles as time allows. Encourage students to add notes in their home language.

Developing–Expanding: Have partners work together to complete a summary triangle. Then have partners compare summary triangles with another pair.

Bridging–Reaching: Have students work with EL students with varying English proficiencies to encourage peer collaboration.

Talk About It

- Use **Thumbs Up** to indicate your understanding of adding and subtracting polynomials.

Paul's Notes

Closure

- Open-Ended Problem:** Create two polynomials, A and B, that satisfy as many characteristics below as possible:
 - One polynomial has an even degree.
 - One polynomial has an odd degree.
 - Each polynomial is at least a binomial.
 - The sum of the polynomials has 4 terms.
 - The difference of the polynomials is a binomial.

EL English Learner Support

Interpreting Mathematical Explanations

Review this section's vocabulary terms with a summary triangle. Typically, the summary triangle is divided into 3 or 4 parts. Students write the concept in the top part. Then students write related categories in the middle part(s). Related categories may include procedure, explanation, description, etc. In the bottom part, students write an example to illustrate the concept. Students may also place their summary triangles on note cards to use as a quick study reference. Support EL students in the following ways.

Entering–Emerging: Assign one concept or term to each small group and have students complete the graphic organizer. Provide feedback and have students complete additional summary triangles as time allows. Allow students to refer to their math vocabulary notebooks and to use one of the parts of the triangle to add notes in their home language.

Developing–Expanding: Assign the same concept or term to each small group and have students complete the graphic organizer. Have small groups trade organizers and provide feedback to each other's group. Repeat as time allows.

Bridging–Reaching: Have students work with EL students of varying levels of proficiency to encourage peer collaboration.

WIDA English Language Development Standards

ELD-MA.9-12.Explain.Expressive Construct mathematical explanations that introduce a mathematical concept or entity.

ELD-MA.9-12.Explain.Interpretive Interpret mathematical explanations by identifying a concept or an entity.

7.1 Support for All Learners

Supporting Student Learning

Use the **Quick Check** exercises to assess understanding of lesson concepts and support emerging learners with additional resources. Remember to check students' Self-Assessment to help inform your instructional decisions.

Reinforce (TIER 1)

Identify where students need support with *this lesson*.

- **Exercise 5:** Classify polynomials.
- **Exercises 7 and 8:** Add and subtract polynomials.
- **Exercise 9:** Model real-life situations using sums and differences of polynomials.

Re-engage (TIER 2)

Identify where students need support with *prior skills*.

- Apply properties of operations to add and subtract linear expressions. **Grade 7 Section 3.2**

Intervene (TIER 3)

Identify where students have additional *unfinished learning*.

- Use the Distributive Property to combine like terms and simplify algebraic expressions with rational coefficients. **Grade 7 Section 3.1**

Deepening Student Learning



Support proficient and advanced learners with suggested resources targeted to promote more complex thinking and deeper understanding of lesson concepts.

Differentiated Resources

Learning is individualized and students may move in and out of proficiency levels with each skill and concept. The online resources provide a wide range of layered support for the diverse needs in your classroom.



India's Notes

Equity in Action

Students may struggle to express themselves due to pressure to perform well in your class. They may shut down, have an anxiety attack, or act out inappropriately. Use equitable practices to assist students struggling with pressure and anxiety.



Listen to India talk about her insights and inspiration on equity in action.

7.1 Practice

See the *Answer Guide* for all Practice notes and answers to help inform next steps for your students.

Data Talk

See the *Answer Guide* for suggestions on how to connect the data display to math and facilitate classroom discussion.

Reinforce (TIER 1)

Identify where students need support with *this lesson*.

- **Exercise 5:** Classify polynomials.
- **Exercises 7 and 8:** Add and subtract polynomials.
- **Exercise 9:** Model real-life situations using sums and differences of polynomials.

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7.1 Practice

See the *Answer Guide* for all Practice notes and answers to help inform next steps for your students.

Algebra 1

Concepts & Connections



Practice Workbook

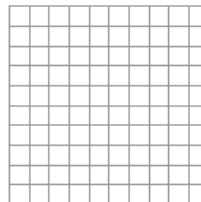
Lesson and Standards-Based Practice

Name _____

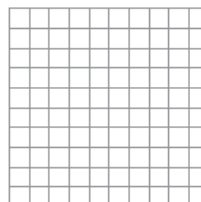
Lesson Extra Practice: Graphing Linear Equations in Slope-Intercept Form

Use intercepts to graph the equation.

1. $-8x + 12y = 24$

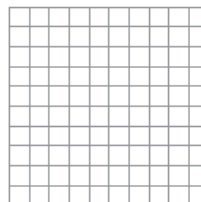


3. $1 + x = 3y$



Graph the equation.

5. $y = -3$



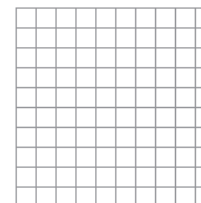
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Name _____ Date _____

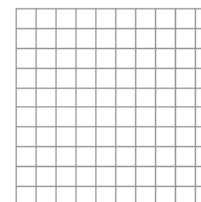
Standards-Based Practice Interpreting Functions: Graph Linear and Quadratic Functions

Graph linear and quadratic functions and show intercepts, maxima, and minima.

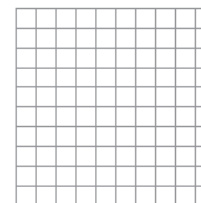
1. Graph $y = -3x + 1$. Identify the intercepts.



2. Graph $y = 2x^2 - 12x + 10$. Tell whether the function has a *maximum value* or a *minimum value*. Then find the value.



3. Use intercepts to graph $4x - 6y = 24$.



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Algebra 1
Practice Workbook: Lesson and Standards-Based Practice



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RESOURCES

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☒ VIEW AS STUDENT

ACTIVITY DETAILS ▾

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Identify an equation with a solution of $x = 5$.

- ☐ $4x + 8 = 3$
- ☐ $2x - 7 = 24$
- ☐ $4x - 3 = 17$
- ☐ $5x - 2 = 28$



1

2

3

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NEXT →

**Screens are in active testing and development and are subject to change.*



Name _____

Skill Builder: Solve Multi-Step Linear Equations**Concept Review**

To solve a multi-step equation, simplify each side of the equation using the properties of operations to isolate the variable.

ExampleSolve $3(x + 1) + 6 = 21$.

$$3(x + 1) + 6 = 21$$

$$3(x) + 3(1) + 6 = 21$$

$$3x + 3 + 6 = 21$$

$$3x + 9 = 21$$

$$\frac{-9}{3} \quad \frac{-9}{3}$$

$$3x = 12$$

$$\frac{3x}{3} = \frac{12}{3}$$

$$x = 4$$

Write the equation

Distributive Property

Multiply.

Combine like terms

Subtraction Property

Simplify.

Division Property

Simplify.

► The solution is $x = 4$.**Try It!**Solve $-6 + 5m - 3m = 10$.

$$-6 + 5m - 3m = 10$$

$$-6 + 2m = 10$$

$$+ \quad +$$

$$2m = 16$$

$$\frac{2m}{2} = \frac{16}{2}$$

$$m = 8$$

Write the equation

Addition Property

Simplify.

Simplify.

► The solution is $m = 8$.

Name _____

Skill Builder: Solve Multi-Step Linear Equations**Practice**

Solve the equation.

1. $3 + 2(m + 15) = 37$

$$3 + \quad + \quad = 37$$

$$3 + \quad + \quad = 37$$

$$\quad + \quad = 37$$

$$- \quad - \quad$$

$$\quad = \quad$$

$$\quad = \quad$$

$$\quad = \quad$$

$$\quad = \quad$$

$$\quad = \quad$$

2. $4x + 6x + 15 = 41$

$$\quad$$

3. $3(12 - g) + 4 = 19$

$$\quad$$

4. $44 = -4 + 6(x - 2)$

$$\quad$$



Name _____ Date _____

Skill Builder: Solve Multi-Step Linear Equations**Quick Check**

Solve the equation.

1. $4(g + 1) + 8 = 36$

$$\quad$$

2. $7x - 2 + 3x = 18$

$$\quad$$

3. $3(m - 5) - 2 = 28$

$$\quad$$

4. $51 = -5 + 7(20 - x)$

$$\quad$$

I can solve
multi-step linear
equations.

1 2 3 4



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instruction



partnership

implementation

Implementation to Support Effective Instruction



Implementation with Big Ideas Learning

Empowering Teachers with the Tools
to Accelerate Learning for All Students.



Welcome to the Big Ideas Family! We are excited to partner with you and support your teachers in effective instruction.

This catalog is a roadmap for effective implementation of your core math program. You will learn about launching your new program, options to enhance your teacher's instruction with Big Ideas Learning, and ways to sustain effective mathematical instructional practices.



THE CORE OF THE PROGRAM

Effectively
implementing the core
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ENHANCING INSTRUCTION

Using research-based
practices to accelerate
learning through
instructional practices.



SUSTAINABILITY

Empowering you as a
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Math & YOU Coherence K-12

**MATH
& YOU**

Students see the relevance

**MATH
& YOU**

Students take part in their
learning

**MATH
& YOU**

You impact learning

B Learning
Academy

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**MATH
& YOU**

concepts & connections