

Algebra I Assignment Overview

April 30th

Directions	Student Checklist
Complete the activities: <ul style="list-style-type: none">• Solving for a Variable• Solving some Equations	<input type="checkbox"/> I solved all of the problems and showed my work. <input type="checkbox"/> I checked my work against the answer key and made corrections.

May 1st

Complete the Activities: <ul style="list-style-type: none">• Checking and Graphing Inequalities• More or Less	<input type="checkbox"/> I solved the problems and showed my work. <input type="checkbox"/> I explained my strategy. <input type="checkbox"/> I checked my work against the answer key and made corrections.
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May 4th

Directions	Student Checklist
Complete the activities: <ul style="list-style-type: none">• What's the Same? What's Different? (Graphs)• Situations & Graphs• Part of Linear Equations	<input type="checkbox"/> I solved all of the problems and showed my work. <input type="checkbox"/> I checked my work against the answer key and made corrections.

May 5th

Directions	Student Checklist
Complete the activities: <ul style="list-style-type: none">• Matching Graphs to Situations• Ride Sharing Among Friends• Finding More Lines	<input type="checkbox"/> I solved all of the problems and showed my work. <input type="checkbox"/> I checked my work against the answer key and made corrections.

May 6th

Directions	Student Checklist
Complete the activities: <ul style="list-style-type: none">• Zero Product Property 1• Equations and Formulas• Reasoning with Linear Inequalities	<input type="checkbox"/> I solved the problems and showed my work. <input type="checkbox"/> I checked my work against the answer key and made corrections.

May 7th

Directions	Student Checklist
Complete the Activities: <ul style="list-style-type: none">• Words - Tables - Graphs	<input type="checkbox"/> I solved the problems and showed my work. <input type="checkbox"/> I checked my work against the answer key and made corrections.

May 8th

Directions	Student Checklist
Complete the Activities: <ul style="list-style-type: none">Unit 2, Lesson 1	<input type="checkbox"/> I solved the problems and showed my work. <input type="checkbox"/> I checked my work against the answer key and made corrections.

May 12th

Directions	Student Checklist
Complete the Activities: <ul style="list-style-type: none">Unit 2, Lesson 2	<input type="checkbox"/> I solved the problems and showed my work. <input type="checkbox"/> I checked my work against the answer key and made corrections.

May 13th

Directions	Student Checklist
Complete the Activities: <ul style="list-style-type: none">Unit 2, Lesson 3	<input type="checkbox"/> I solved the problems and showed my work. <input type="checkbox"/> I checked my work against the answer key and made corrections.

May 14th

Directions	Student Checklist
Complete the Activities: <ul style="list-style-type: none">Unit 2, Lesson 7	<input type="checkbox"/> I solved the problems and showed my work. <input type="checkbox"/> I checked my work against the answer key and made corrections.

May 15th

Directions	Student Checklist
Complete the Activities: <ul style="list-style-type: none">Unit 2, Lesson 10	<input type="checkbox"/> I solved the problems and showed my work. <input type="checkbox"/> I checked my work against the answer key and made corrections.

Support for students, parents, and guardians:

- Teachers will be available to answer questions through Zoom on the following dates. To access the support call, following the directions below
 - Thursday, May 7th, 12:00 – 12:45 p.m.**
 - Click on the link <https://zoom.us/j/3791568353>, OR
 - Open Zoom, click join, and enter Meeting ID: 379 156 8353
 - Thursday, May 14th, 12:00 – 12:45 p.m.**
 - Click on the link <https://zoom.us/j/3791568353>, OR
 - Open Zoom, click join, and enter Meeting ID: 379 156 8353

13.2: Solving for a Variable

Solve for the indicated variable.

1. Solve for k . $2t + k = 6$

2. Solve for n . $10n = 2p$

3. Solve for c . $12 - 6d = 3c$

4. Solve for g . $h = 8g + 4$

5. Solve for x . $4x + 3y = 12$

6. Solve for y . $4x + 3y = 12$

13.3: Solving Some Equations

Solve each equation.

row	column A	column B
1	$4(2x + 8) - 10 = 14$	$4 + 2(-3x + 5) = 20$
2	$3(x - 4) + 6 = 60$	$3(\frac{1}{2}x + 9) - 5 = 55$
3	$4(\frac{x+3}{2}) - 5 = 10$	$7 - 2(6x + 1) = -49$
4	$2x + (5 - 3x) = 14$	$1 = 5x + 10 - 4x$
5	$4x + 2(3 - x) = 16$	$x + 2(x - 4) + 5 = 12$
6	$2x - 2(3x - 1) = 8$	$-6x + 2(4x + 5) = 7$

20.2: Checking and Graphing Inequalities

Solve each inequality. Then, check your answer using a value that makes your solution true.

1. $-2x < 4$

a. Solve the inequality.

b. Check your answer using a value that makes your solution true.

2. $3x + 5 > 6x - 4$

a. Solve the inequality.

b. Check your answer using a value that makes your solution true.

3. $-3(x + 1) \geq 13$

a. Solve the inequality.

b. Check your answer using a value that makes your solution true.

For each statement:

- Use a number line to show which values satisfy the inequality.
- Express the statement symbolically with an inequality.

1. The elevator can lift up to 1,200 pounds. Let x represent the weight being lifted by the elevator.



2. Over the course of the senator's term, her approval rating was always around 53% ranging 3% above or below that value. Let x represent the senator's approval rating.



3. There's a minimum of 3 years of experience required. Let x represent the years of experience a candidate has.



21.2: More or Less

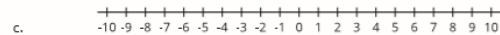
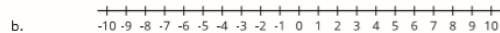
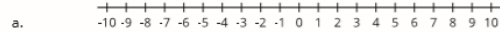
1. Write at least 3 values for x that make the inequality true.

a. $x < -2$

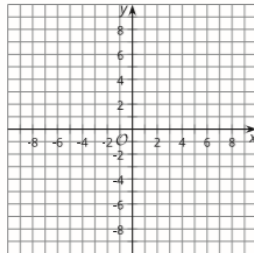
b. $x + 2 > 4$

c. $2x - 1 \leq 7$

2. Graph the solution to each inequality on a number line.



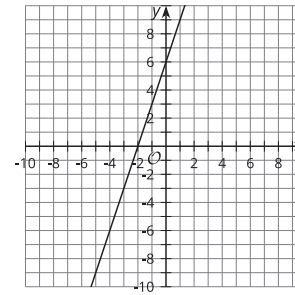
3. Using the inequality $x < -2$, write 3 coordinate pairs for which the x -coordinate makes the inequality true. Use the coordinate plane to plot your 3 points.



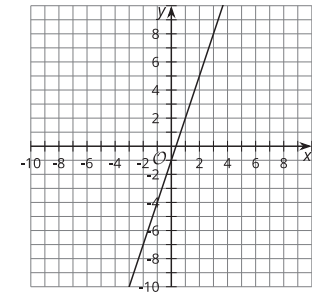
10.2: What's the Same? What's Different?

Here are the graphs of four linear equations.

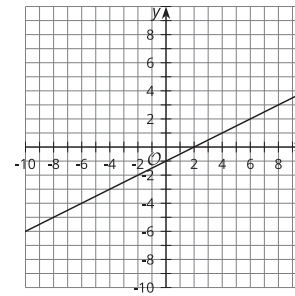
Graph A



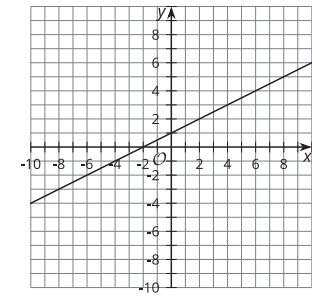
Graph B



Graph C



Graph D



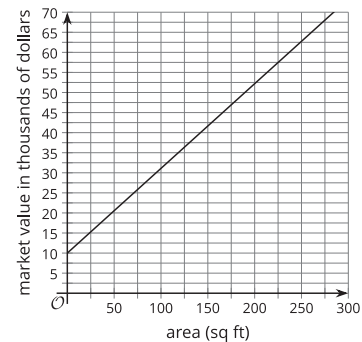
1. Which graphs have a slope of 3?
2. Which graphs have a slope of $\frac{1}{2}$?
3. Which graphs have a y -intercept of -1?
4. Which graphs have an x -intercept of -2?

5. Graph A represents the equation $2y - 6x = 12$. Which other equations could graph A represent?

- a. $y - 3x = 6$
- b. $y = 3x + 6$
- c. $y = -3x + 6$
- d. $2y = -6x + 12$
- e. $4y - 12x = 12$
- f. $4y - 12x = 24$

6. Write three equations that graph B could represent.

2. The market value of a house is determined by the size of the house.

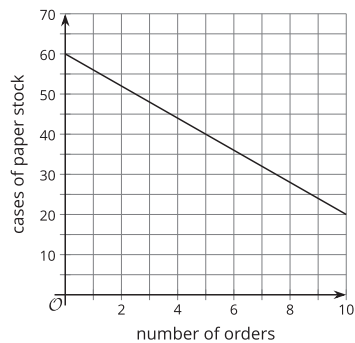


DO NOT DO
PROBLEM 2

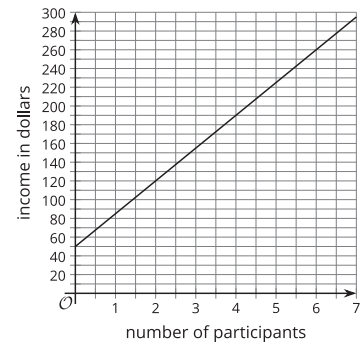
10.3: Situations and Graphs

For each situation, find the slope and intercepts of the graph. Then, describe the meaning of the slope and intercepts. Determine if the values you come up with are reasonable answers for the situation.

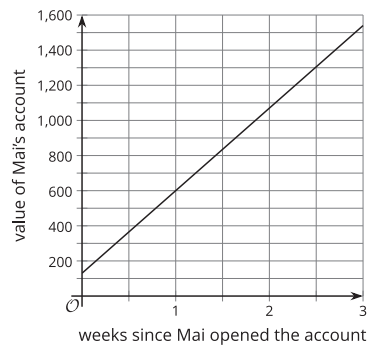
1. The printing company keeps an inventory of the number of cases of paper it has in stock.



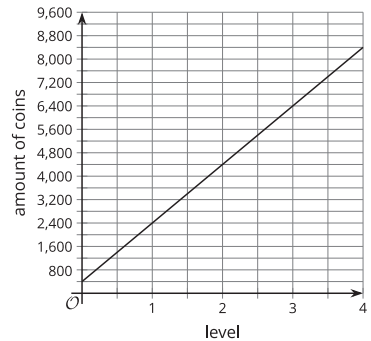
3. Tyler teaches paint classes in which the amount of money he makes depends on the number of participants he has.



4. Mai tracks the amount of money in her no-interest savings account.



5. Priya earns coins for each new level she reaches on her game.



11.3: Part of Linear Equations

For each equation, identify the slope and y-intercept of its graph.

1. $y = 3x - 8$

2. $y = 10 - 2x$

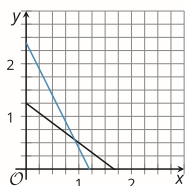
3. $y = \frac{x}{2} + 1$

4. $y + 1 = 9x$

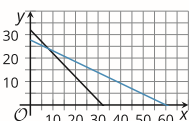
5. $y = \frac{1}{3}(9x + 12)$

12.2: Matching Graphs to Situations

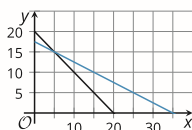
D



E



F



1. Match each pair of graphs to a situation.

- A restaurant has a total of 20 tables—round tables that seat 2 people and rectangular tables that seat 4 people. All 70 seats in the restaurant are occupied.
- A family buys a total of 32 tickets at a carnival. Ride tickets cost \$1.50 each and food tickets cost \$3.25 each. The family pays a total of \$90 for the tickets.
- Tyler and Andre are shopping for snacks in bulk at the grocery store. Tyler pays \$10 for 6 ounces of almonds and 8 ounces of raisins. Andre pays \$12 for 10 ounces of almonds and 5 ounces of raisins.

2. Answer these questions about each situation:

- What do x and y represent in the situation?
- At what point do the graphs intersect? What do the coordinates mean in this situation?

12.3: Ride Sharing Among Friends

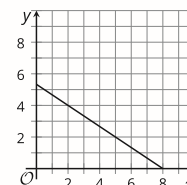
A ride sharing company offers two options: riding in small cars that can carry up to 3 passengers each, or riding in large vans that can carry up to 6 passengers each. A group of 27 people is going to use the ride sharing service to take a trip. The trip in a small car costs \$10 and the trip in a large van costs \$15. The group ends up spending \$80 total.

1. An equation that represents one of the constraints is $3x + 6y = a$.

a. What is the value of a ?

b. What do x and y represent?

2. An equation that represents the other constraint is $cx + 15y = 80$. What is the value of c ?



3. Here is a graph that represents one of the constraints. Which one? Explain how you know.

4. Sketch another line on the graph that represents the other constraint.

5. For each coordinate pair, describe its meaning in the situation and decide whether it satisfies the constraint on total number of people, the constraint on cost, or neither.

a. (2, 4)

b. (1, 4)

c. (3, 2)

6. At what point do the two lines intersect? What does this point mean in this situation?

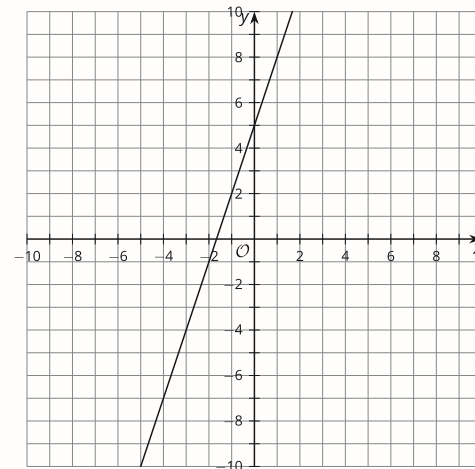
14.3: Finding More Lines

For each system of equations:

- Solve the system of equations by graphing. Write the solution as an ordered pair.
- Write an equation that would be represented by a vertical or horizontal line that also passes through the solution of the system of equations.
- Graph your new equation along with the system.

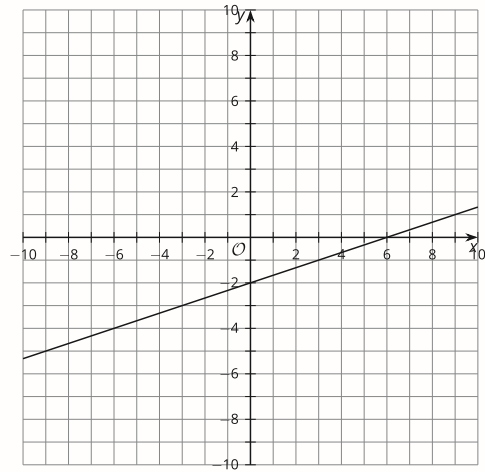
1.
$$\begin{cases} y = 3x + 5 \\ y = -x + 1 \end{cases}$$

The line representing $y = 3x + 5$ is shown



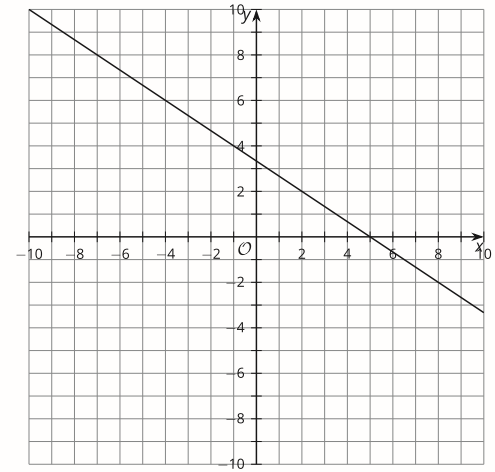
$$2. \begin{cases} y = \frac{1}{3}x - 2 \\ y = x - 6 \end{cases}$$

The line representing $y = \frac{1}{3}x - 2$ is shown



$$3. \begin{cases} 2x + 3y = 10 \\ x + y = 3 \end{cases}$$

The line representing $2x + 3y = 10$ is shown



A-REI Zero Product Property 1

Alignments to Content Standards: A-REI.A.1

Task

In each of the following equations, the variables represent real numbers. Assuming each equation is true, what can you conclude about the values of the variables? Explain each step in your reasoning.

a. $2z + 3 = 0$

b. $7x = 0$

c. $7(y - 5) = 0$

d. $ab = 0$

A-CED Equations and Formulas

Alignments to Content Standards: A-CED.A.4

Task

Use inverse operations to solve the equations for the unknown variable, or for the designated variable if there is more than one. If there is more than one operation to “undo”, be sure to think carefully about the order in which you do them. For equations with multiple variables, it may help to first solve a version of the problem with numerical values substituted in.

a. $5 = a - 3$

b. $A - B = C$ (solve for A)

c. $6 = -2x$

d. $IR = V$ (solve for R)

e. $\frac{x}{5} = 3$

f. $W = \frac{A}{L}$ (solve for A)

g. $7x + 3 = 10$

h. $ax + c = R$ (solve for x)

i. $13 = 15 - 4x$

j. $2h = w - 3p$ (solve for p)

k. $F = \frac{GMm}{r^2}$ (solve for G)

A-REI Reasoning with linear inequalities

Alignments to Content Standards: A-REI.B.3 A-REI.A.1

Task

The following is a student solution to the inequality

$$\begin{aligned} \frac{5}{18} - \frac{x-2}{9} &\leq \frac{x-4}{6} \\ \frac{5}{18} - \frac{x-2}{9} &\leq \frac{x-4}{6} \\ \frac{5}{18} - \frac{2x-2}{9} &\leq \frac{3x-4}{6} \\ \frac{5}{18} - \frac{2x-2}{18} &\leq \frac{3x-4}{18} \\ 5 - (2x-2) &\leq 3x-4 \\ 5 - 2x + 2 &\leq 3x-4 \\ 7 - 2x &\leq 3x-4 \\ -5x &\leq -11 \\ x &\leq \frac{11}{5} \end{aligned}$$

a. There are two mathematical errors in this work. Identify at what step each mathematical error occurred and explain why it is mathematically incorrect.

The first mathematical error occurred going from line ____ to line ____.

Why it is incorrect:

The second mathematical error occurred going from line ____ to line ____.

Why it is incorrect:

b. How would you help the student understand his mistakes?

c. Solve the inequality correctly.

F-IF Words - Tables - Graphs

Alignments to Content Standards: F-IF.B.4

Task

Below are 4 verbal descriptions, 3 graphs, and 3 tables of values. Match each of the following descriptions with an appropriate graph and table of values. Create the missing graph and the missing table of values.

- The weight of your jumbo box of cereal decreases by an equal amount every week.
- The value of the bicycle depreciated rapidly at first, but its value declined more slowly as time went on.
- The tennis ball is dropped off the roof of a skyscraper.
- For a while it looked like the decline in profits was slowing down, but then they began declining more rapidly.

A.

x	0	1	2	3	4	5
y	400	384	336	256	144	0

B.

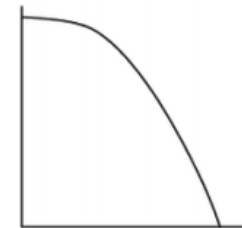
1

x	0	1	2	3	4	5
y	400	184	98	63	49	43

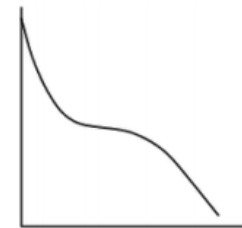
C.

x	0	1	2	3	4	5
y	400	253	218	216	181	34

a.

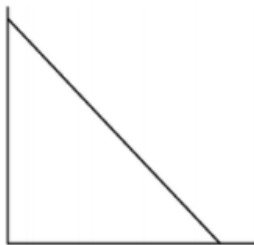


b.



c.

2



Unit 2 Lesson 1 Cumulative Practice Problems

1. The videography team entered a contest and won a monetary prize of \$1,350.

Which expression represents how much each person would get if there were x people on the team?

- A. $\frac{1350}{x}$
- B. $1350 + x$
- C. $\frac{1350}{5}$
- D. $1350 - x$

2. To support a local senior citizens center, a student club sent a flyer home to the n students in the school. The flyer said, "Please bring in money to support the senior citizens center. Paper money and coins accepted!" Their goal is to raise T dollars.

Match each quantity to an expression, an equation, or an inequality that describes it.

- | | |
|--|---------------|
| A. the dollar amount the club would have if they reached half of their goal | 1. $T + 50$ |
| | 2. $0.5T$ |
| B. the dollar amount the club would have if every student at the school donated 50 cents to the cause | 3. $0.25n$ |
| | 4. $0.5n$ |
| C. the dollar amount the club could donate if they made \$50 more than their goal | 5. $T - 0.5n$ |
| D. the dollar amount the club would still need to raise to reach its goal after every student at the school donated 50 cents | |
| E. the dollar amount the club would have if half of the students at the school each gave 50 cents | |

3. Each of the 10 students in the baking club made 2 chocolate cakes for a fundraiser. They all used the same recipe, using C cups of flour in total.

Write an expression that represents the amount of flour required for one cake.

4. A student club started a fundraising effort to support animal rescue organizations. The club sent an information flyer home to the n students in the school. It says, "We welcome donations of any amount, including any change you could spare!" Their goal is to raise T dollars, and to donate to a cat shelter and a dog shelter.

Match each quantity to an expression, an equation, or an inequality that describes it.

- | | |
|--|---|
| <p>A. The dollar amount the club would have if they reached one-fourth of their goal.</p> | <p>1. $\frac{3}{4}n \cdot \frac{1}{2}$</p> <p>2. $\frac{1}{4}T$</p> |
| <p>B. The dollar amount the club would have if every student at the school donated a quarter to the cause.</p> | <p>3. $T - \frac{1}{4}n$</p> <p>4. $\frac{3}{4}T$</p> |
| <p>C. The dollar amount the club could donate to the cat shelter if they reached their goal and gave a quarter of the total donation to a dog shelter.</p> | <p>5. $\frac{1}{4}n$</p> |
| <p>D. The dollar amount the club would still need to raise to reach its goal after every student at the school donated a quarter.</p> | |
| <p>E. The dollar amount the club would have if three-fourths of the students at the school each gave 50 cents.</p> | |

5. A softball team is ordering pizza to eat after their tournament. They plan to order cheese pizzas that cost \$6 each and four-topping pizzas that cost \$10 each. They order c cheese pizzas and f four-topping pizzas.

Which expression represents the total cost of all of the pizzas they order?

- A. $6 + 10$
- B. $c + f$
- C. $6c + 10f$
- D. $6f + 10c$

6. The value of coins in the pockets of several students is recorded. What is the mean of the values: 10, 20, 35, 35, 35, 40, 45, 45, 50, 60

- A. 10 cents
- B. 35 cents
- C. 37.5 cents
- D. 50 cents

(From Unit 1, Lesson 9.)

Unit 2 Lesson 2 Cumulative Practice Problems

1. Large cheese pizzas cost \$5 each and large one-topping pizzas cost \$6 each.

Write an equation that represents the total cost, T , of c large cheese pizzas and d large one-topping pizzas.

2. Jada plans to serve milk and healthy cookies for a book club meeting. She is preparing 12 ounces of milk and 4 cookies per person. Including herself, there are 15 people in the club. A package of cookies contains 24 cookies and costs \$4.50.

A 1-gallon jug of milk contains 128 ounces and costs \$3. Let n represent number of people in the club, m represent the ounces of milk, c represent the number of cookies, and b represent Jada's budget in dollars.

Select all of the equations that could represent the quantities and constraints in this situation.

- A. $m = 12(15)$
 - B. $3m + 4.5c = b$
 - C. $4n = c$
 - D. $4(4.50) = c$
 - E. $b = 2(3) + 3(4.50)$
3. A student on the track team runs 45 minutes each day as a part of her training. She begins her workout by running at a constant rate of 8 miles per hour for a minutes, then slows to a constant rate of 7.5 miles per hour for b minutes.

Which equation describes the relationship between the distance she runs in miles, D , and her running speed, in miles per hour?

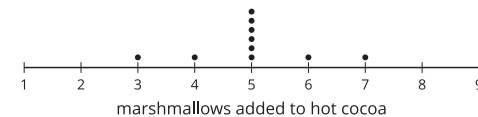
- A. $a + b = 45$
- B. $8a + 7.5b = D$
- C. $8(\frac{a}{60}) + 7.5(\frac{b}{60}) = D$
- D. $8(45 - b) + 7.5b = D$

4. Elena bikes 20 minutes each day for exercise.

Write an equation to describe the relationship between her distance in miles, D , and her biking speed, in miles per hour, when she bikes:

- a. at a constant speed of 13 miles per hour for the entire 20 minutes
- b. at a constant speed of 15 miles per hour for the first 5 minutes, then at 12 miles per hour for the last 15 minutes
- c. at a constant speed of M miles per hour for the first 5 minutes, then at N miles per hour for the last 15 minutes

5. The dot plot displays the number of marshmallows added to hot cocoa by several kids. What is the MAD of the data represented in the dot plot?



- A. 0.6 marshmallows
- B. 3 marshmallows
- C. 4 marshmallows
- D. 5 marshmallows

(From Unit 1, Lesson 11.)

6. Here is a data set: 5 10 10 10 15 100
- a. After studying the data, the researcher realized that the value 100 was meant to be recorded as 15. What happens to the mean and standard deviation of the data set when the 100 is changed to a 15?
 - b. For the original data set, with the 100, would the median or the mean be a better choice of measure for the center? Explain your reasoning.

(From Unit 1, Lesson 12.)

7. A coach for a little league baseball team is ordering trophies for the team. Players on the team are allowed to choose between 2 types of trophies. The gold baseball trophies cost \$5.99 each and the uniform baseball trophies cost \$6.49 each. The team orders g gold baseball trophies and u uniform baseball trophies.
- Write an expression that could represent the total cost of all of the trophies.

(From Unit 2, Lesson 1.)

8. The robotics team needs to purchase \$350 of new equipment. Each of the x students on the team plans to fundraise and contribute equally to the purchase.
- Which expression represents the amount that each student needs to fundraise?

- A. $350 - x$
- B. $350 + x$
- C. $\frac{350}{x}$
- D. $350 \cdot x$

(From Unit 2, Lesson 1.)

9. In a trivia contest, players form teams and work together to earn as many points as possible for their team. Each team can have between 3 and 5 players. Each player can score up to 10 points in each round of the game. Elena and four of her friends decided to form a team and play a round.

Write an expression, an equation, or an inequality for each quantity described here. If you use a variable, specify what it represents.

- a. the number of points that Elena's team earns in one round
- b. the number of points Elena's team earns in one round if every player scores between 6 and 8 points
- c. the number of points Elena's team earns if each player misses one point
- d. the number of players in a game if there are 5 teams of 4 players each
- e. the number of players in a game if there are at least 3 teams

(From Unit 2, Lesson 1.)

Unit 2 Lesson 3 Cumulative Practice Problems

1. A landscaping company is delivering crushed stone to a construction site. The table shows the total weight in pounds, W , of n loads of crushed stone.

number of loads of crushed stone	total weight in pounds
0	0
1	2,000
2	4,000
3	6,000

Which equation could represent the total weight, in pounds, for n loads of crushed stone?

A. $W = \frac{6,000}{n}$

B. $W = 6,000 - 2,000n$

C. $W = 2,000n$

D. $W = n + 2,000$

2. Members of the band sold juice and popcorn at a college football game to raise money for an upcoming trip. The band raised \$2,000. The amount raised is divided equally among the m members of the band.

Which equation represents the amount, A , each member receives?

A. $A = \frac{m}{2,000}$

B. $A = \frac{2,000}{m}$

C. $A = 2,000m$

D. $A = 2,000 - m$

3. Tyler needs to complete this table for his consumer science class. He knows that 1 tablespoon contains 3 teaspoons and that 1 cup contains 16 tablespoons.

number of teaspoons	number of tablespoons	number of cups
		2
36	12	
	48	3

a. Complete the missing values in the table.

b. Write an equation that represents the number of teaspoons, t , contained in a cup, C .

4. The volume of dry goods, like apples or peaches, can be measured using bushels, pecks, and quarts. A bushel contains 4 pecks, and a peck contains 8 quarts.

What is the relationship between number of bushels, b , and the number of quarts, q ? If you get stuck, try creating a table.

7. Elena has \$225 in her bank account. She takes out \$20 each week for w weeks. After w weeks she has d dollars left in her bank account.

Write an equation that represents the amount of money left in her bank account after w weeks.

(From Unit 2, Lesson 2.)

8. Priya is hosting a poetry club meeting this week and plans to have fruit punch and cheese for the meeting. She is preparing 8 ounces of fruit punch per person and 2 ounces of cheese per person. Including herself, there are 12 people in the club.

A package of cheese contains 16 ounces and costs \$3.99. A one-gallon jug of fruit punch contains 128 ounces and costs \$2.50. Let p represent number of people in the club, f represent the ounces of fruit punch, c represent the ounces of cheese, and b represent Priya's budget in dollars.

Select **all** of the equations that could represent the quantities and constraints in this situation.

- A. $f = 8 \cdot 12$
- B. $c = 2 \cdot 3.99$
- C. $2 \cdot 3.99 + 2.50 = b$
- D. $2p = c$
- E. $8f + 2c = b$

(From Unit 2, Lesson 2.)

9. The density of an object can be found by taking its mass and dividing by its volume.

Write an equation to represent the relationship between the three quantities (density, mass, and volume) in each situation. Let the density, D , be measured in grams/cubic centimeters (or g/cm^3).

- a. The mass is 500 grams and the volume is 40 cubic centimeters.
- b. The mass is 125 grams and the volume is v cubic centimeters.
- c. The volume is 1.4 cubic centimeters and the density is 80 grams per cubic centimeter.
- d. The mass is m grams and the volume is v cubic centimeters.

(From Unit 2, Lesson 2.)

Unit 2 Lesson 7 Cumulative Practice Problems

1. Match each equation with an equivalent equation. Some of the answer choices are not used.

- | | |
|------------------------|-----------------------|
| A. $3x + 6 = 4x + 7$ | 1. $9x = 4x + 7$ |
| B. $3(x + 6) = 4x + 7$ | 2. $3x + 18 = 4x + 7$ |
| C. $4x + 3x = 7 - 6$ | 3. $3x = 4x + 7$ |
| | 4. $3x - 1 = 4x$ |
| | 5. $7x = 1$ |

2. Mai says that equations A and B have the same solution.

- Equation A: $-3(x + 7) = 24$
- Equation B: $x + 7 = -8$

Which statement explains why this is true?

- A. Adding 3 to both sides of Equation A gives $x + 7 = -8$.
- B. Applying the distributive property to Equation A gives $x + 7 = -8$.
- C. Subtracting 3 from both sides of Equation A gives $x + 7 = -8$.
- D. Dividing both sides of Equation A by -3 gives $x + 7 = -8$.

3. Is 0 a solution to $2x + 10 = 4x + 10$? Explain or show your reasoning.

4. Kiran says that a solution to the equation $x + 4 = 20$ must also be a solution to the equation $5(x + 4) = 100$.

Write a convincing explanation as to why this is true.

5. The entrepreneurship club is ordering potted plants for all 36 of its sponsors. One store charges \$8.50 for each plant plus a delivery fee of \$20. The equation $320 = x + 7.50(36)$ represents the cost of ordering potted plants at a second store.

What does the x represent in this situation?

- A. The cost for each potted plant at the second store
- B. The delivery fee at the second store
- C. The total cost of ordering potted plants at the second store
- D. The number of sponsors of the entrepreneurship club

(From Unit 2, Lesson 4.)

6. Which equation is equivalent to the equation $5x + 30 = 45$?

- A. $35x = 45$
- B. $5x = 75$
- C. $5(x + 30) = 45$
- D. $5(x + 6) = 45$

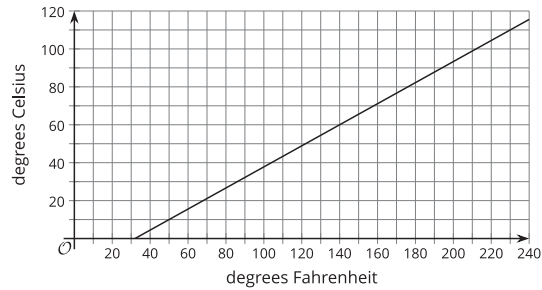
(From Unit 2, Lesson 6.)

7. The environmental science club is printing T-shirts for its 15 members. The printing company charges a certain amount for each shirt plus a setup fee of \$20.

If the T-shirt order costs a total of \$162.50, how much does the company charge for each shirt?

(From Unit 2, Lesson 4.)

8. The graph shows the relationship between temperature in degrees Celsius and temperature in degrees Fahrenheit.



- Mark the point on the graph that shows the temperature in Celsius when it is 60 degrees Fahrenheit.
- Mark the point on the graph that shows the temperature in Fahrenheit when it is 60 degrees Celsius.
- Water boils at 100 degrees Celsius. Use the graph to approximate the boiling temperature in Fahrenheit, or to confirm it, if you knew what it is.
- The equation that converts Celsius to Fahrenheit is $C = \frac{5}{9}(F - 32)$. Use it to calculate the temperature in Celsius when it is 60 degrees Fahrenheit. (This answer will be more exact than the point you found in the first part.)

(From Unit 2, Lesson 5.)

9. Select **all** the equations that have the same solution as $2x - 5 = 15$.

- $2x = 10$
- $2x = 20$
- $2(x - 5) = 15$
- $2x - 20 = 0$
- $4x - 10 = 30$
- $15 = 5 - 2x$

(From Unit 2, Lesson 6.)

10. Diego's age d is 5 more than 2 times his sister's age s . This situation is represented by the equation $d = 2s + 5$. Which equation is equivalent to the equation $d = 2s + 5$?

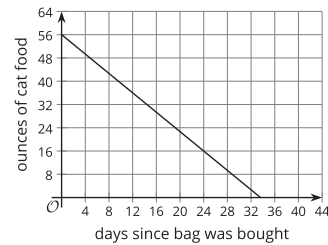
- $d = 2(s + 5)$
- $d - 5 = 2s$
- $d - 2 = s + 5$
- $\frac{d}{2} = s + 5$

(From Unit 2, Lesson 6.)

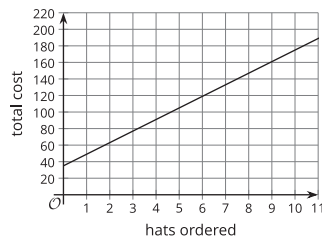
Unit 2 Lesson 10 Cumulative Practice Problems

1. Andre bought a new bag of cat food. The next day, he opened it to feed his cat. The graph shows how many ounces were left in the bag on the days after it was bought.

- How many ounces of food were in the bag 12 days after Andre bought it?
- How many days did it take for the bag to contain 16 ounces of food?
- How much did the bag weigh before it was opened?
- About how many days did it take for the bag to be empty?



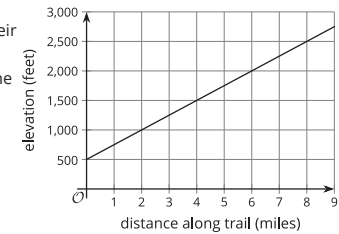
2. A little league baseball team is ordering hats.



The graph shows the relationship between the total cost, in dollars, and the number of hats ordered.

What does the slope of the graph tell us in this situation?

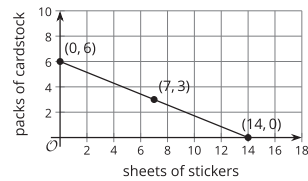
- It tells us that there is a fixed cost of approximately \$35 for ordering hats.
 - It tells us the amount that the total cost increases for each additional hat ordered.
 - It tells us that when 9 hats are ordered, the total cost is approximately \$160.
 - It tells us that when the number of hats ordered increases by 10, the total cost increases by approximately \$175.
3. A group of hikers is progressing steadily along an uphill trail. The graph shows their elevation (or height above sea level), in feet, at each distance from the start of the trail, in miles.



- What is the slope of the graph? Show your reasoning.
- What does the slope tell us about this situation?
- Write an equation that represents the relationship between the hikers' distance from the start of the trail, x , and their elevation, y .
- Does the equation $y - 250x = 500$ represent the same relationship between the distance from the start of trail and the elevation? Explain your reasoning.

4. A kindergarten teacher bought \$21 worth of stickers and cardstock for his class. The stickers cost \$1.50 a sheet and the cardstock cost \$3.50 per pack. The equation $1.5s + 3.5c = 21$ represents the relationship between sheets of stickers, s , packs of cardstocks, c , and the dollar amount a kindergarten teacher spent on these supplies.

a. Explain how we can tell that this graph represents the given equation.



b. What do the vertical and horizontal intercepts, (0, 6) and (14, 0), mean in this situation?

5. In physics, the equation $PV = nRT$ is called the ideal gas law. It is used to approximate the behavior of many gases under different conditions. P , V , and T represent pressure, volume, and temperature, n represents the number of moles of gas, and R is a constant for the ideal gas.

Which equation is solved for T ?

- A. $\frac{PV}{R} = nT$
- B. $\frac{PV}{nR} = T$
- C. $T = PV - nR$
- D. $PVnR = T$

(From Unit 2, Lesson 9.)

6. To raise funds for uniforms and travel expenses, the soccer team is holding a car wash in a part of town with a lot of car and truck traffic. The team spent \$90 on supplies like sponges and soap. They plan to charge \$10 per car and \$20 per truck. Their goal is to raise \$460.

How many cars do they have to wash if they washed the following numbers of trucks?

- a. 4 trucks
- b. 15 trucks
- c. 21 trucks
- d. 27 trucks
- e. t trucks

(From Unit 2, Lesson 9.)

7. During the Middle Ages, people often used grains, scruples, and drahms to measure the weights of different medicines.

If 120 grains are equivalent to 6 scruples and 6 scruples are equivalent to 2 drahms, how many drahms are equivalent to 300 grains? Explain your reasoning. If you get stuck, try creating a table.

(From Unit 2, Lesson 3.)

8. Explain why the equation $2(3x - 5) = 6x + 8$ has no solutions.

(From Unit 2, Lesson 7.)

9. Consider the equation $3a + 0.1n = 123$. If we solve this equation for n , which equation would result?

A. $0.1n = 123 - 3a$

B. $n = 123 - 3a - 0.1$

C. $n = 1,230 - 30a$

D. $\frac{3a - 123}{0.1} = n$

(From Unit 2, Lesson 8.)

10. Diego is buying shrimp and rice to make dinner. Shrimp costs \$6.20 per pound and rice costs \$1.25 per pound. Diego spent \$10.55 buying shrimp and rice. The relationship between pounds of shrimp s , pounds of rice r , and the total cost is represented by the equation $6.20s + 1.25r = 10.55$.

Write an equation that makes it easy to find the number of pounds of rice if we know the number of pounds of shrimp purchased.

(From Unit 2, Lesson 8.)

Algebra I Answers

April 30th

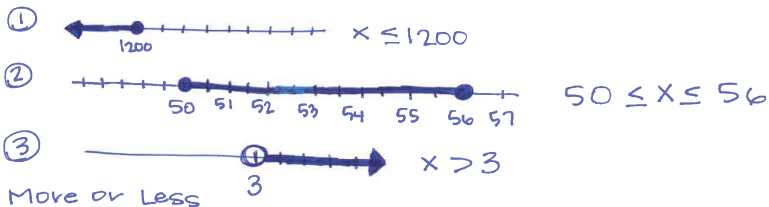
- ① $k = -2t + 6$ ② $n = \frac{2p}{10} = \frac{p}{5}$ ③ $4 - 2d = c$
 ④ $\frac{h}{8} - \frac{1}{2} = g$ ⑤ $x = -\frac{3}{4}x + 3$ ⑥ $y = -\frac{4}{3}x + 4$

	column A	column B
①	$x = -1$	$x = -1$
②	$x = 22$	$x = 22$
③	$x = \frac{9}{2}$	$x = \frac{9}{2}$
④	$x = -9$	$x = -9$
⑤	$x = 5$	$x = 5$
⑥	$x = -\frac{3}{2}$	$x = -\frac{3}{2}$

Solving Some Equations

May 1st

- Checking and Graphing Inequalities
 ① a) $x > -2$ b) when $x = 0$, the solution is true.
 ② a) $x < 3$ b) when $x = 1$, the solution is true
 ③ a) $x \leq -\frac{16}{3}$ b) when $x = -\frac{16}{3}$, the solution is true



More or Less

- ① a) $x = -3, -4, -5$ $x = 5, 10, 100$
 b) $x > 2$ $x = 0, -3, \frac{1}{2}$
 c) $x \leq 4$

May 4th

- ① graph B ② graph D
 ③ graph B+c ④ graph A+D
 ⑤ a, b, +f
 ⑥ answers may vary
 $2y = 6x - 2$ $y + 1 = 3x$ $3x - y = 1$ $y = 3x - 1$

Situations and Graphs

- ① Slope = -2, y-int = 60, x-int = -30
 the printing company started with 30 cases of paper stocked. For every 2 orders, 1 case of paper is used. After 30 orders, there will be no more stocked.
 ② skip
 ③ Slope = 35, x-int = $-\frac{8}{7}$, y-int = 40
 Tyler makes \$50 for hosting a class and \$35 per participant. The x-int is not realistic because you cannot have $-\frac{8}{7}$ of a participant.
 ④ Slope = $\frac{700}{1.5} = \frac{1400}{3}$, x-int = $-\frac{2}{7}$, y-int = $\frac{400}{3}$
 Mai opened the account w/ \$133.33. She earned \$1400 every 3 weeks. The x-int isn't realistic because you can't have $-\frac{2}{7}$ weeks.
 ⑤ slope = 2000, x-int = $-\frac{1}{5}$, y-int = 400
 Priya starts the game with 400 coins. She earns 2000 coins for each level she reaches. The x-int isn't realistic because she cannot have a (-) level.

Part of Linear Equations

- ① $m=3$ $b=-8$
- ② $m=-2$ $b=10$
- ③ $m=\frac{1}{2}$ $b=1$
- ④ $m=9$ $b=-1$
- ⑤ $m=3$ $b=4$

May 5th

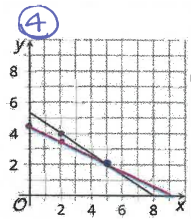
Matching Graphs to Situations

- ① a) F (5,15) The restaurant has 5 round tables and 15 rectangular
- b) E (8,24) The family brought 8 ride tickets and 24 food tickets
- c) D (0.92, 0.56) Tyler & Andre buy almonds for 92¢ an ounce & 56¢ an ounce for raisins.

Ride Sharing Among Friends

- ① a) $a=27$
b) $x=\text{car}$ $y=\text{van}$
- ② $c=10$
- ③ $10x + 15y = 80$; when this equation is written in slope int form, the starting point is \$5.33.

- ⑤ 2 cars 4 vans people cost ④
a) people cost 30 80
b) 1 car 4 vans ppl cost 27 70
c) 3 cars 4 vans 33 90 people



⑥ The 2 lines intersect at (5,2). This means they took 5 cars 2 vans.

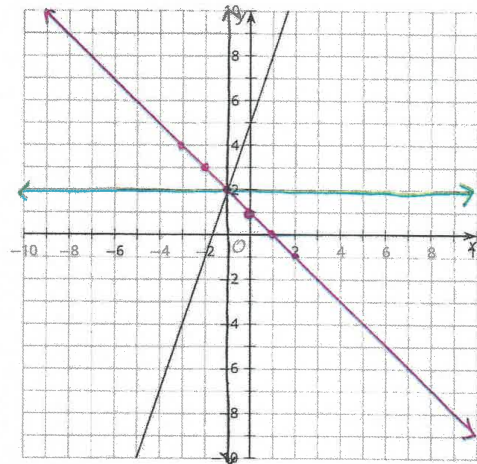
14.3: Finding More Lines

For each system of equations:

- Solve the system of equations by graphing. Write the solution as an ordered pair.
- Write an equation that would be represented by a vertical or horizontal line that also passes through the solution of the system of equations.
- Graph your new equation along with the system.

1. $\begin{cases} y = 3x + 5 \\ y = -x + 1 \end{cases}$

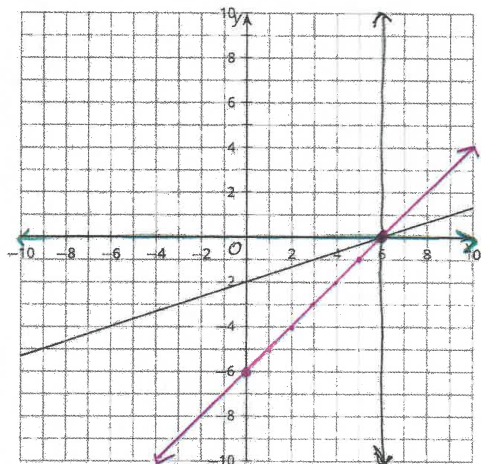
The line representing $y = 3x + 5$ is shown



- Solution: (-1, 2)
- answers could be either be: $x = -1$ or $y = 2$

$$2. \begin{cases} y = \frac{1}{3}x - 2 \\ y = x - 6 \end{cases}$$

The line representing $y = \frac{1}{3}x - 2$ is shown.

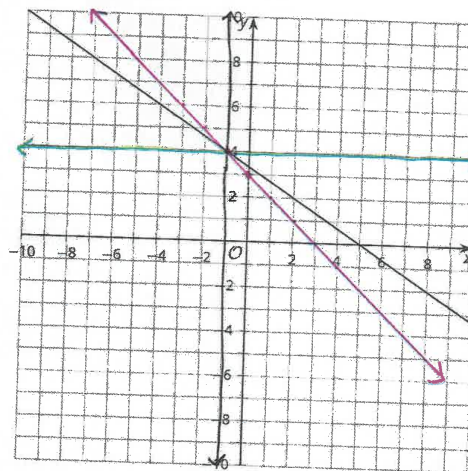


- solution (6, 0)
- answers can be either:
- $x = 6$ or $y = 0$

$$3. \begin{cases} 2x + 3y = 10 \\ x + y = 3 \end{cases}$$

The line representing $2x + 3y = 10$ is shown

$$x + y = 3 \\ y = -x + 3$$



- solution (-1, 4)
- answers can be either be
- $x = -1$ or $y = 4$

[May 6th]

A-REI Zero Product Property 1

Alignments to Content Standards: A-REI.A.1

Task

In each of the following equations, the variables represent real numbers. Assuming each equation is true, what can you conclude about the values of the variables? Explain each step in your reasoning.

a. $2z + 3 = 0$

b. $7x = 0$

c. $7(y - 5) = 0$

d. $ab = 0$

IM Commentary

This task is the first in a series that leads students to understand and apply the zero product property to solving quadratic equations. The emphasis is on using the structure of a factorable expression in order to justify the steps in a solution (rather than memorizing steps without understanding). Teachers should feel free to skip any tasks in the series that students have already mastered.

In this particular task, we ask question that lead up to getting students to, in part (d), state the zero product property: If the product of two numbers is zero, then one of the two numbers must be zero. In symbols, where a and b represent numbers, if $ab = 0$, then $a = 0$ or $b = 0$.

In tasks that follow in this series, students will prove this property and then apply it to solving quadratic equations. In using this task, there should be a strong emphasis on explaining each step in solving the equation.

In part (c), students who have rehearsed procedures for solving linear equations may be inclined to first distribute the 7, then add 35 to both sides, then divide both sides by 7. This procedure will likely result in the correct solution $y = 5$, and students often adopt an attitude of "anything that gets the right answer is okay." However, it is worth taking the time to inspect both solution methods, and for students to understand how one can take advantage of the structure of $7(y - 5) = 0$ to reason that y must be 5 without going through the hassle of multiplying by 7 and then turning around and dividing by 7. Not only is exploiting the structure of the factored expression more efficient in this case, but it's crucial to reasoning about the solutions to quadratic and (later) polynomial equations in factored form.

Other tasks in this series:

- Zero Product Property 2
- Zero Product Property 3
- Zero Product Property 4

Edit this solution

Solution

a. In $2z + 3 = 0$, we are adding 3 to some number, $2z$, and getting 0; therefore that number must be equal to -3 . So we can write $2z = -3$. In $2z = -3$, -3 is double some number z , so z must be half of -3 , so we can write $z = \frac{-3}{2}$.

b. If $7x = 0$, that means 7 times some number is 0. The only number we can multiply 7 by to get 0 is 0. Therefore, $x = 0$.

c. Just like in part (b), this equation is saying "7 times something is 0." Except in this case, the "something" is $(y - 5)$. Therefore we can write $y - 5 = 0$, and y must be 5.

d. In $ab = 0$, we are multiplying two things together and getting a result of 0. If that is true, at least one of those numbers must be 0. So it must be true that either $a = 0$ or $b = 0$ or both.

A - CED Equations & Formulas

a) $a = 8$

b) $A = C + B$

c) $x = -3$

d) $R = \frac{V}{I}$

e) $x = 15$

f) $A = wL$

g) $x = 1$

h) $x = \frac{R - C}{a}$

i) $x = \frac{1}{2}$

j) $p = \frac{w - 2h}{3}$

k) $G = \frac{Fr^2}{Mm}$



Reasoning w/ Linear Inequalities Solution:

The following is a student solution to the inequality

$$\begin{aligned} \frac{5}{18} - \frac{x-2}{9} &\leq \frac{x-4}{6} \\ \frac{5}{18} - \frac{2x-2}{9} &\leq \frac{3x-4}{6} \\ \frac{5}{18} - \frac{2x-2}{18} &\leq \frac{3x-4}{18} \\ 5 - (2x-2) &\leq 3x-4 \\ 5 - 2x + 2 &\leq 3x-4 \\ 7 - 2x &\leq 3x-4 \\ -5x &\leq -11 \\ x &\leq \frac{11}{5} \end{aligned}$$

a. There are two mathematical errors in this work. Identify at what step each mathematical error occurred and explain why they are mathematically incorrect.

The first mathematical error occurred going from line __ 2 __ to line __ 3 __.

Why it is incorrect: The error is an incorrect application of the distributive property in two places. The second term should be $\frac{2x-4}{18}$ and the term on the right hand side of the inequality should be $\frac{3x-12}{18}$.

The second mathematical error occurred going from line __ 7 __ to line __ 8 __.

Why it is incorrect: The student divided both sides of an inequality by -5; the direction of the inequality should be reversed when multiplying (dividing) by a negative number.

b. How would you help the student understand his mistakes?

First mistake:

Here are some possible responses.

I would remind the student of the statement of the distributive property $a(b+c) = ab+ac$ and recall that since $a-c$ is an abbreviation of $a(b+c)$, this also implies $a(b-c) = ab-ac$.

To illustrate the distributive property I would ask the student to evaluate $2(5 - 2)$ in two ways. Then I would point out that the rule still held when 5 was replaced by x .

To illustrate the distributive property I would ask the student to evaluate $2(x - 2)$. Then I would point out that the same distribution takes place when the $x - 2$ is the numerator of a fraction.

The student may have a deep conceptual confusion or made have made a 'careless' mistake caused by misreading the problem. A blind application of PEMDAS might lead the student to think that multiplication before addition means the expression $2x - 2$ (ignoring the denominator to multiply the numerators) evaluates to $2x - 2$. We should remember that the fraction bar means that the numerator and the denominator are each a term. So,

$$\frac{x-2}{9} = (x-2)(9^{-1}).$$

There are several ways in which the 'multiplication by 1' in line 2 might be written:

$$\begin{aligned} &\frac{2}{2} \cdot \frac{x-2}{9}, \\ &\frac{2}{2} \left(\frac{x-2}{9} \right), \\ &\frac{2}{2} \cdot \frac{x-2}{9}. \end{aligned}$$

Students may not recognize the equivalence of these various expressions.

Second mistake:

To illustrate the law that if $b \leq c$ and a is negative then $ab \geq bc$, I would ask, what the result would be dividing from both sides of the inequality $6 \leq 12$ by -2 . That is, which is bigger $\frac{6}{-2}$ or $\frac{12}{-2}$?

c. Solve the inequality correctly.

Method I. This method minimally corrects the students attempt.

$$\begin{aligned} &\frac{5}{18} - \frac{x-2}{9} \leq \frac{x-4}{6} \\ &\frac{5}{18} - \frac{2}{2} \left(\frac{x-2}{9} \right) \leq \frac{3}{3} \left(\frac{x-4}{6} \right) \\ &\frac{5}{18} - \frac{2x-4}{18} \leq \frac{3x-12}{18} \\ &5 - (2x-4) \leq 3x-12 \\ &5 - 2x + 4 \leq 3x - 12 \\ &9 - 2x \leq 3x - 12 \\ &-5x \leq -21 \\ &x \geq \frac{21}{5} \end{aligned}$$

Method II. This is a slightly more efficient method.

$$\begin{aligned} &\frac{5}{18} - \frac{x-2}{9} \leq \frac{x-4}{6} \\ &18 \left(\frac{5}{18} - \frac{x-2}{9} \right) \leq 18 \left(\frac{x-4}{6} \right) \\ &5 - 2(x-2) \leq 3(x-4) \\ &5 - 2x + 4 \leq 3x - 12 \\ &9 - 2x \leq 3x - 12 \\ &-5x \leq -21 \\ &x \geq \frac{21}{5} \end{aligned}$$



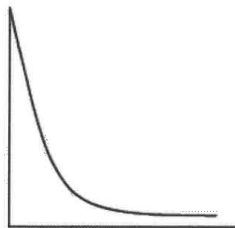
words - tables - graphs solution

Description 1 indicates a constant rate of change. The graph must be (III), since the line has a constant rate of change. The table must show a change for each time interval of 1 as the same. In the table shown below, the change for each time interval of 1 is 80.

x	0	1	2	3	4	5
y	400	320	240	160	80	0

(x represents time in weeks. y represents weight, probably in grams, at least that would fit best with the numbers.)

Description 2 indicates a rapid change and then a slow change. The table must be (B), since the change in each interval of 1 decreases as x increases. The graph must drop quickly and then slow, as shown below.



(x represents time, in years (makes most sense) y represents value in dollars (could be other currencies))

Description 3 indicates a slow change and then a rapid change. The graph must be (I), since it decreases slowly at first and then drops quickly. The table must be (A), since the change in each interval of 1 increases as x increases.

(x represents height in meters of feet y represents time, in seconds (makes most sense))

Description 4 indicates a quick change then a slow change and then a quick change.

The graph must be (II), since the graph drops quickly, then steadies for a short while, and then drops quickly again. The table must be (C), since the change in each interval of 1 is large, then small, and then large again.

(x represents time, the units are not given and could vary, i.e. days, weeks, years are all possible. y represents profit in dollars, (could be different currency or method to measure profits))



F-IF Words - Tables - Graphs
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[May 8th]

- ① A
- ② a) 2 b) 4 c) 1 d) 5 e) 3
- ③ $\frac{c}{2 \cdot 10}$ or $\frac{c}{20}$
- ④ a) 2 b) 5 c) 4 d) 3 e) 1
- ⑤ C
- ⑥ C

[May 12th]

- ① $5c + 6d = T$
- ② A, C, E
- ③ C
- ④ a) $D = 13 \cdot \frac{1}{3}$
b) $D = 15 \cdot \frac{1}{2} + 12 \cdot \frac{1}{4}$
c) $D = \frac{1}{12} M + \frac{1}{4} N$
- ⑤ A
- ⑥ a) mean changes from 25 to about 10.83
b) median would be a better choice
- ⑦ $5.999 + 6.494^5$
- ⑧ C

- ⑨ a) $S \leq 50$ (and possibly $S \geq 0$), where S is the score of the team
 b) $S \geq 30$ and $S \leq 40$
 c) $a = 5$
 d) $S = 4$
 e) $p \geq 9$, where p is the # of players in the game

[May 13th]

- ① C
 ② B

③ a)

TS	TBS	C
96	32	2
36	12	0.75
144	48	3

b) $t = 48c$

④ $32b = 9$
 [skip 5 & 6]
 ⑦ $225 - 20w = d$

- ⑧ A, C, D

⑨ a) $D = \frac{500}{40}$ or $D = 12.5$
 b) $D = \frac{125}{10}$
 c) $80 = \frac{m}{1.4}$
 d) $D = \frac{m}{1}$

[May 14th]

- ① a) 4
 b) 2
 c) 5

- ② D

③ It is a soln. $2 \cdot 0 + 10 = 10$ $4 \cdot 0 + 10 = 10$

④ 2 equations are equivalent. Multiplying $x + 4 = 20$ by 5 gives $5(x + 4) = 100$. Multiplying both sides by the same number keeps it equal.

- ⑤ B

- ⑥ D

⑦ 9.50

⑧ a) $(60, 15.5)$

b) $(140, 60)$

c) 212°F

d) $\frac{140}{9}$ or 15.5°C

- ⑨ B, D, E

- ⑩ B

[May 15th]

① a) 2002 b) 24 days c) 5002

d) It took 24 days (about)

- ② B

③ a) 250

b) slope tells us how many ft the hikers elevation increases for each mile they hike

c) $y = 500 + 250x$

d) years

④ a) if we sub the pairs of coordinate values of the points on the graph into the equation, we will have true statements, which means those points are solutions to the equation.

b) the vertical int of $(0, 6)$ means that if the teacher bought no stickers, he must have bought 6 pks of cardstock. the horizontal int $(14, 0)$, means if ~~he~~ he bought no cardstock, he bought 14 sheets of stickers

⑤ B

⑥ a) 47 cars b) 25 cars c) 13 cars

d) 1 car e) $\frac{460 + 90 - 2t}{10}$ or $\frac{550 - 20t}{10}$

⑦ 5 drahms are equivalent to 300 grains. Since 4 scruples are 2 drahms, I know 1 drahm is 3 scruples. Since 3 scruples is 60 grains, I know that 1 drahm is 60 grains, so 5 drahms is 300 grains.

⑧ $6x - 10 = 6x + 8$. not equal

⑨ C ⑩ $r = \frac{10 \cdot 55 - 6 \cdot 205}{1.25}$