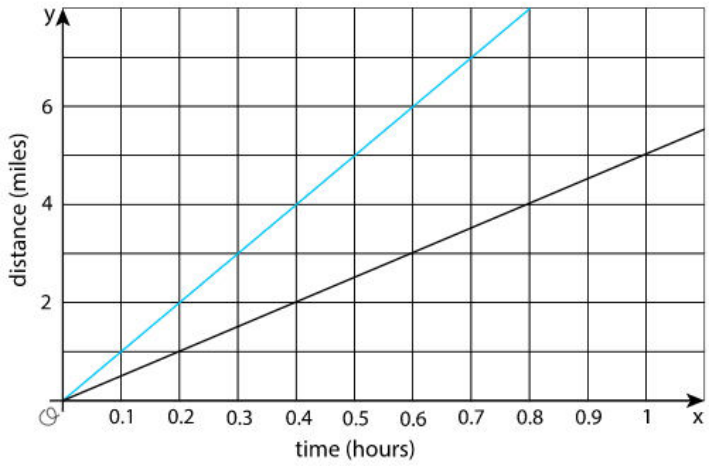
Unit 13
Lesson 1 Homework Answers

Problem 1



Problem 2

A ray that passes through $(0, 0)$ and $(6, 16.5)$.

Problem 3

a. On the line
b. On the line
c. Not on the line
d. On the line

Problem 4

$\frac{y+4}{x-2} = \frac{3}{4}$ (or equivalent)

Lesson2

Problem 1

A ray through $(0, 0)$ and $(2, 8)$.

Problem 2

Sample Answer

distance (cm)	weight (newtons)
20	28
55	77
100	140
1	$\frac{7}{5}$

Problem 3

Answers vary. Sample response:

a. Begin with figure $BCDE$.

b. Dilate using A as the center of dilation with scale factor $\frac{1}{3}$.

c. Rotate using A as the center clockwise 30 degrees.

d. Reflect along the line that contains A and the image of E under the previous transformations.

Problem 4

Diego is correct. Two figures are congruent if one can be moved to the other using a sequence of rigid transformations, and they are similar if one can be moved to the other using a sequence of rigid transformations and dilations. If two figures are congruent, then they are also similar. Scalings (such as Diego's suggested scaling with a scale factor of 1) can also be applied. While scalings are allowed, they're not always *required* to show that two figures are similar.

Lesson 3

Problem 1

a. y=3/2x

b.

grams of fish	number of calories
1000	1500
1334	2001
1	$\frac{3}{2}$

Problem 2

a. M = 12/5 R (or equivalent)

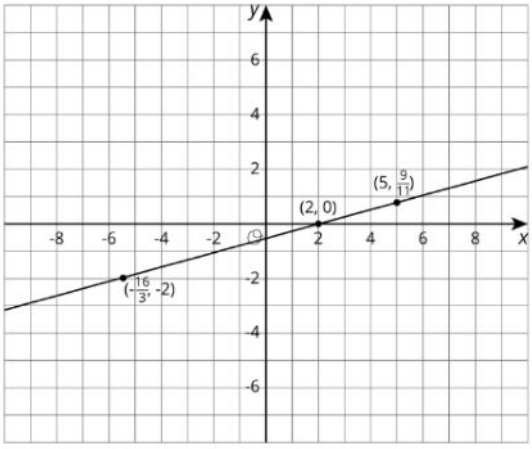
b. On coordinate axes with R on the horizontal axis and M on the vertical axis, a ray through (0,0) and (10,24) or equivalent

Problem 3

Answers vary. Sample response: Build a slope triangle. If its vertical length is greater than its horizontal length, the slope is greater than 1. If its vertical and horizontal lengths are equal, the slope is equal to 1. If the slope triangle's vertical length is less than its horizontal length, the slope is less than 1.

Problem 4

Answers vary. Possible response:



(Note that there is one point on the line which has to be treated differently. The point $(2, 0)$ is on the sketched line but is not a pair that can be plugged into $\frac{y}{x-2} = \frac{3}{11}$, as it results in a denominator of 0. The point $(2, 0)$ does satisfy the equivalent equation $y = \frac{3}{11}(x - 2)$, however.)

Lesson 4

Problem 1

a. Assuming that both pricing plans are proportional relationships, EZ Excavation: $980, Happy Hauling Service: $1000.
b. EZ Excavation: $24.50/cu yd, Happy Hauling Service: $25/cu yd.
c. EZ Excavation. It would cost $980 and be under budget.

Problem 2

Andre walks 600 more steps than Priya.

Problem 3

$(0, 7\frac{1}{2}), (0, 5\frac{2}{3})$

Problem 4

B, C, D

Lesson 5

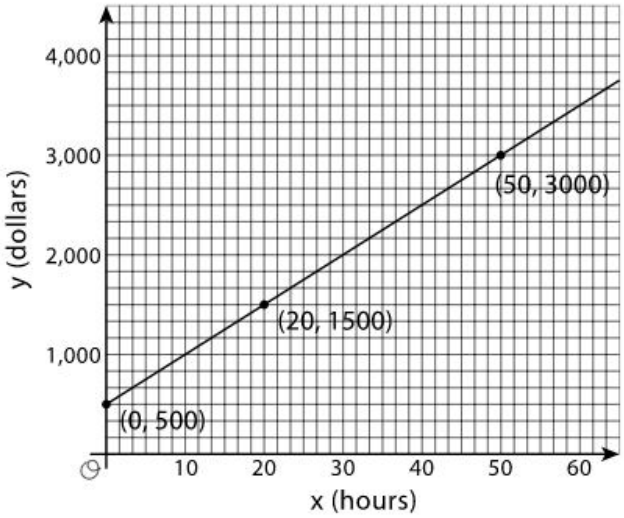
Problem 1

7 pizzas

Problem 2

a. $1500, $3000

b.



c. The slope of the line is 50, which is the same as the price per hour, in dollars, that the painting company charges for labor.

Problem 3

a. Tyler, who ran 2 hundredths of a mile farther.
b. Tyler had a pace of 8 1/3 minutes per mile, and Elena had a pace of 8.5 minutes per mile.
c. Tyler ran faster because it took him fewer minutes to run a mile.

Problem 4

$y = 1/2\ x + 4$

Lesson 6

Problem 1

Answers vary. Sample responses:

a. The slope of 3 shows that the triangle has 3 sides. For each increase of 1 unit of the side length, the perimeter increases by 3 units. The intercept of 0 shows that the relationship is proportional—a triangle with sides of length 0 has a perimeter of length 0.
b. The slope of means that each ticket is $0.25. The intercept of 8 represents the $8 already in the cash box.
c. The slope of 1/4 shows that 5 chapters are read every 4 days. The intercept might show that 2 chapters were read before beginning to read 5 chapters every 4 days, or it show that an additional 2 chapters were read on the first day.
d. The slope 5/4 shows that $2 are added for each muffin ordered. The intercept of 3 probably represents a $3 delivery fee or tip for the order.

Problem 2

a. Lin: 3 cups, Noah: 4 cups
b. Lin: 10 cups, Noah: 7 1/2 cups

Problem 3

a. The cost for each class, which is $20
b. The membership fee to join, which is $60

Lesson 7

Problem 1

a. First: 6 cups, second: 7 cups
b. First: 1 1/2 cups of flour per cup of sugar, second: 1 3/4 cups of flour per cup of sugar

Problem 2

Translate H to D, reflect across a vertical line through D, and then dilate using a scale factor of 1/2 centered at D.

Problem 3

Answers vary. Sample response: Three graphs, one a line through $(0, 2)$ and $(5, 3)$, one a line through $(0, 3)$ and $(5, 6)$, and one a line through $(0, 4)$ and $(5, 10)$.

$y = \frac{1}{5}x + 2, y = \frac{3}{5}x + 3, y = \frac{6}{5}x + 4$

Problem 4

a. $h = 3t + 12$

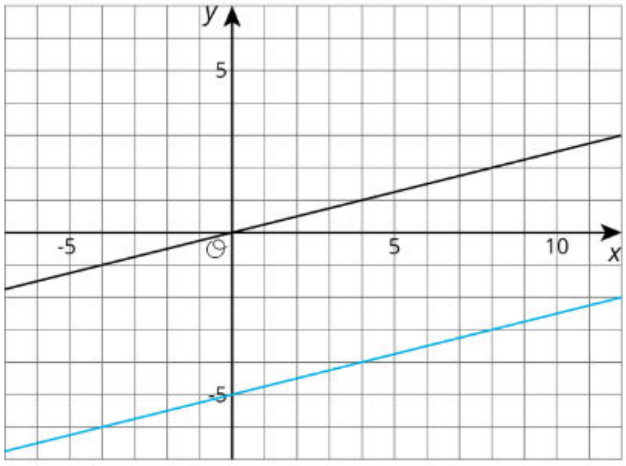
b. 18 months. Explanations vary. Sample response: Substitute $h = 66$, and solve the equation $66 = 3t + 12$. $3t = 54, t = 18$.

Lesson 8

Problem 1

A, D, E, F

Problem 2



Answers vary. Sample response: The graphs have the same slope of 1/4 but different y-intercepts. The first is 0, and the second is -5. Another sample response: Each (x,y) on the first graph is translated down by 5 to get a corresponding point on the second graph.

Problem 3

a. $y = 70x$

b. $y = 70x + 100$

c. The two lines are parallel, with the second line being the first line translated vertically 100 units upwards.

Problem 4

a. 2

b. 4

c. 1

d. 3

Problem 5

a. 4800 feet above sea level

b. The point would be (0, 4800) located on the y-axis.

Lesson 9

Problem 1

a. Zero
b. Negative
c. Positive

Problem 2

a. 4 miles. The y-intercept represents this initial distance before the start of the hike.

b. $d = 4 + 3h$

c. 4 hours. Explanations vary. Sample response: On the graph, $d = 16$ when $h = 4$. The equation can be used to solve for h when $d = 16$: $16 = 4 + 3h$, $12 = 3h$ and $h = 4$.

Problem 3

B, C, F

Problem 4

A. 3
B. 2
C. 1

Lesson 10

Problem 1

A: $\frac{-2}{6}$, B: -1, C: $\frac{-5}{4}$

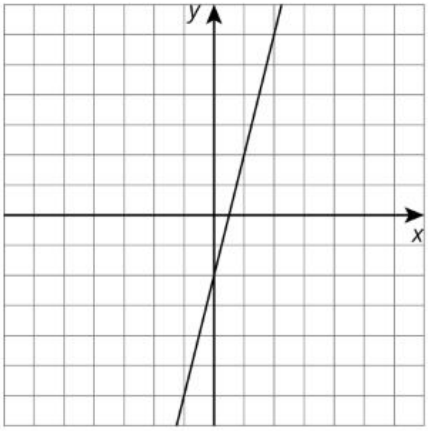
Problem 2

a. 1
b. 4
c. 2
d. 1
e. 3

Problem 3

a. B
b. D
c. E
d. B

Problem 4



The equation is $y = 4x - 2$. I can tell the slope is 4 by looking at the points $(0, -2)$ and $(1, 2)$ since $\frac{2-(-2)}{1-0} = \frac{4}{1} = 4$.

Lesson 11

Problem 1

a. Start with the intercept (0. -1), and use the slope of -4 to move down 4 and 1 to the right (or up 4 and 1 to the left) to find other points. Or, find two or more solutions to the equation and graph the points whose coordinates are the ordered pairs of the solutions, then draw a line connecting the points.

b. Check the intercept and slope. Identify the coordinates of some points on the line, and substitute them into the equation to make sure they make the equation true.

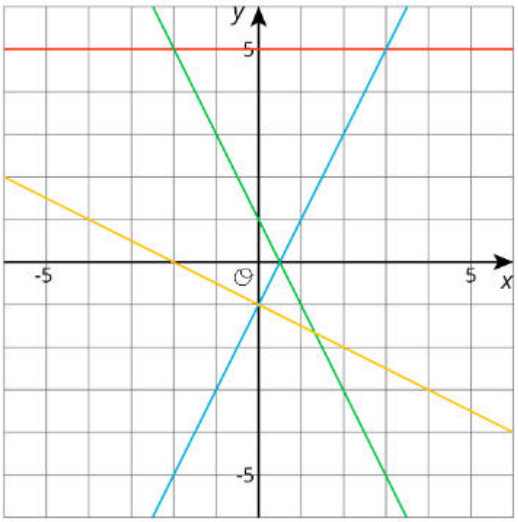
Problem 2

a. Red line

b. Blue line

c. Green line

d. Yellow line



Problem 3

Green line: $x = -1$, yellow line: $x = 6$, red line: $y = 4$, blue line: $y = -2$

Problem 4

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

b. $y = \frac{1}{2} + \frac{2}{5}x$

c. $y = \frac{2}{3} + \frac{1}{4}x$ and $y = \frac{2}{3} + \frac{2}{5}x$, respectively

Lesson 12

Problem 1

A, E, F

Problem 2

a. Priya has $20 before buying any comics, and if she buys 5 comics, Priya will have no money left.
b. The slope is -4. The amount of money left goes does down by 4 with each comic book; each comic book costs $4.
c. y = -4x + 20
d. $8

Problem 3

a. 1
b. 4
c. 2
d. 5
e. 3

Problem 4

Negative because the amount of fuel in the tank is decreasing.

Problem 5

$7. Explanations vary. Sample response: The second office pays $61 - 33$, or 28 dollars more, for $8 - 4$, or 4, more sandwiches. So each sandwich adds $28 \div 4$, or 7 dollars, to the cost.

Lesson 13

Problem 1

a. $y = -10, x = -1$

b. $y = -2, x = 3$

c. $y = 8, x = 3$

d. $y = \frac{-19}{4}, x = 6$

e. $y = 6.5, x = -6$

Problem 2

a. 4
b. 1
c. 3
d. 2

Problem 3

True, all three points make the equation true.

Problem 4

a. $(1, 1.5)$: Yes, check it with the equation; $(12, 4)$: No, when $x = 12$, y would be 4.25, not 4.

b. $(-5, 0)$ Explanations vary. Sample response: Set $y = 0$ in the equation.

Problem 5

$B = (3, -5), C = (3, 5), D = (0, -1)$

Lesson 14

Problem 1

a. No 2-seat and 30 4-seat, 10 2-seat and 25 4-seat, 40 2-seat and 10 4-seat. Explanations vary. Sample response: I decided on a number for the 2-seat tables, then figured out how many people that would be (multiply number of tables by 2) and subtracted that from 120. Then I divided by 4 to get the number of 4-seat tables needed for the remaining people.

b. Answers vary. Sample response: $2x + 4y = 120$. x represents the number of 2-seat tables and y represents the number of 4-seat tables.

c. Graph is the line connecting $(0, 30)$ and $(60, 0)$.

d. Answers vary. Sample response. The slope is $\frac{-1}{2}$. $\frac{-1}{2}$ tells us that for every one fewer 4-seat table we can use 2 2-seat tables.

e. The intercepts are $(0, 30)$ and $(60, 0)$. They tell us how many tables there will be if only 4-seat tables are used (30) or only 2-seat tables are used (60).

Problem 2

a. Answers vary; the key constraint is that the three angles must sum to 180 ($x + x + y = 180$). For example, $x = y = 60$, or $x = 30$ and $y = 120$ or $x = 45$ and $y = 90$.

b. $2x + y = 180$

c. -2. In the context of the triangle, for every 1 degree increase of x, y decreases by 2 degrees.

Problem 3

A, C, D

Problem 4

The line ℓ moves up on the y-axis as it moves to the right, so it has a positive slope. m has a negative slope since it moves downwards. The slope of ℓ is $\frac{80-20}{8-5} = \frac{60}{3} = 20$. The slope of m is $\frac{-40-20}{8-5} = \frac{-60}{3} = -20$.