Investigation 1 Additional Practice

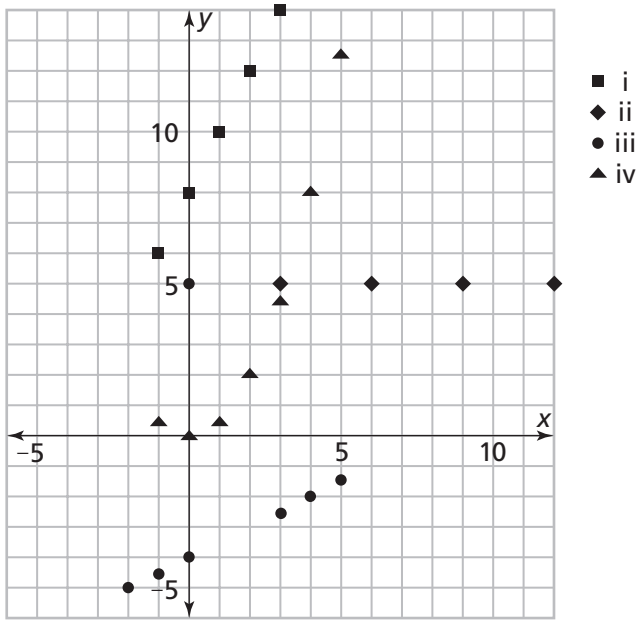
1. **a.** Francine: 4.5 mph; Geraldo: 6 mph; Jennifer: 7.5 mph; Divide the number of miles traveled in 4 hours by 4.
   b. Francine: 27 miles; Geraldo: 36 miles; Jennifer: 45 miles
2. **a.** (Figure 1)
   b. Students' estimates should be close to the following values: Francine: 11.25 miles; Geraldo: 15 miles; Jennifer: 18.75 miles
   c. Students' estimates should be close to the following values: Francine: 15.6 hours; Geraldo: 11.7 hours; Jennifer: 9.3 hours
   d. The faster the cyclist, the steeper the graph.
3. **a.** Francine: $D = 4.5t$; Geraldo: $D = 6t$; Jennifer: $D = 7.5t$
   b. Substitute 2.5 for t in each question.
   c. the number being multiplied by t
4. **a.** 7.25 miles per hour
   b. Stilton's graph would be steeper than Francine's and Geraldo's but less steep than Jennifer's.
5. **a.** $y = 4x - 3$ **b.** $y = 9 - 5x$
   c. $y = 2x + 3$
6. $y = x + 3$

x	0	−1	−2	−3
y	3	2	1	0

7. $y = 1 - x$

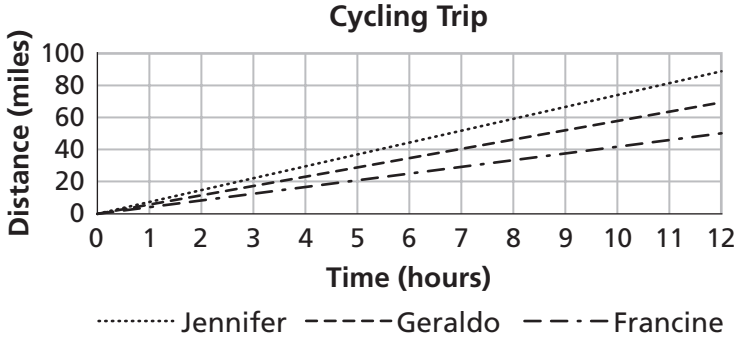
x	0	1	2	3
y	1	0	−1	−2

8. Yes, the point is $(-1, 2)$, which is where the two lines intersect on the graph. The point $(-1, 2)$ is on both lines so it satisfies both equations.
9. **a.**



   b. Sets i, ii, and iii represent linear relationships. The graphs of these data sets are straight lines.

Figure 1



Moving Straight Ahead Practice Answers

Skill: Linear Relationships

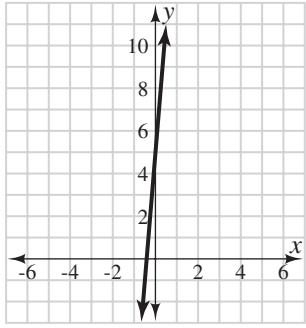
1. yes **2.** no

3. yes **4.** no

5. $y = 12x + 5$

a. \$77

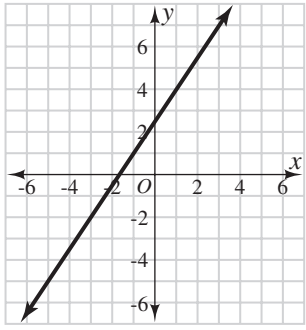
b. \$53



6. $y = 1.5x + 2.5$

a. \$16

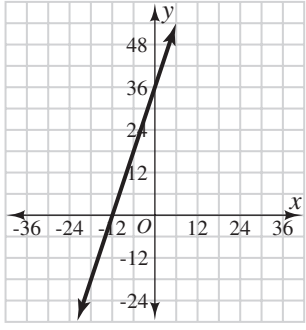
b. \$38.50



7. $y = 3x + 36$

a. 57 in.

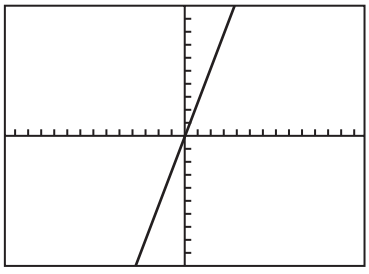
b. 120 in.



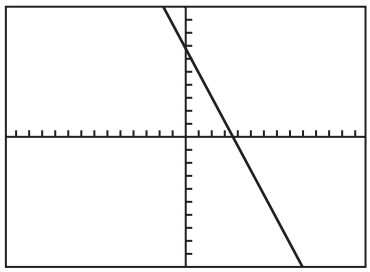
8. $y = -\frac{5}{4}x + 2$ **9.** $y = 2x - 4$

Investigation 2 Additional Practice

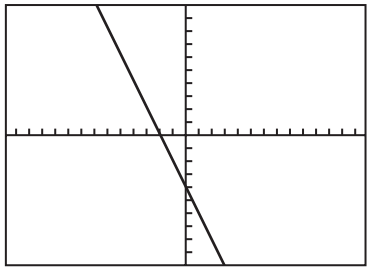
1. a. i.



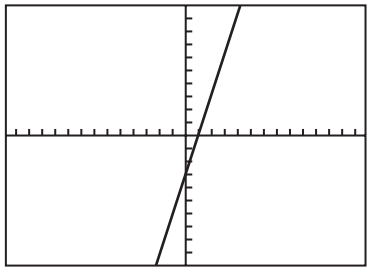
ii.



iii.



iv.



b. i.

```
WINDOW
 XMIN=-10
 XMAX=10
 XSCL=1
 YMIN=-10
 YMAX=10
 YSCL=1
```

ii.

```
WINDOW
 XMIN=-10
 XMAX=10
 XSCL=1
 YMIN=-10
 YMAX=10
 YSCL=1
```

iii.

```
WINDOW
 XMIN=-10
 XMAX=10
 XSCL=1
 YMIN=-20
 YMAX=20
 YSCL=2
```

iv.

```
WINDOW
 XMIN=-10
 XMAX=10
 XSCL=1
 YMIN=-10
 YMAX=10
 YSCL=1
```

c. i. increase **ii.** decrease
iii. decrease **iv.** increase

d. i. $(0, 0)$ **ii.** $(0, 7)$
iii. $(0, -8)$ **iv.** $(0, -3)$

e. i.–iv. Answers will vary

2. a. \$25; \$50 **b.** \$25
c. \$100 − \$50 = \$50

3. a. $(2, 17), (9, 52), (2.9, 21.5)$
b. $(10, 11), (24, 32)$
c. $(5, -8.75), (-2.75, 14.5)$

4. a. Possible answer: $(-4, 0), (0, 2)$, and $(2, 3)$
b. ii. $y = 0.5x + 2$
c. no; The x-value 56 corresponds to the y-value 30, not 35.
d. yes; The x-value -20 does correspond to the y-value -8.

5. The equation for the line labeled A: $y = 3 - x$; the equation for the line labeled B: $y = 2 + x$; the equation for the line labeled C: $y = -4 + 2x$
a. (Figure 1)
b. line A: $y = 3 - x$, line B: $y = 2 + x$, line C: $y = -4 + 2x$

6. The equation of the line labeled A: $y = x + 3$; The equation of the line labeled B: $y = x + 1$
a. They are parallel; they cross the y-axis at different points.
b. Change the constant value of 3 to 1
c. $y = x + 1$
d. $y = x + 2$; 2 is halfway between 3 and 1

7. The graph is of the equation $y = \frac{1}{2}x - 1$

a.

x	y
-3	$-2\frac{1}{2}$
0	-1
2	0
5	$1\frac{1}{2}$
7	$2\frac{1}{2}$
10	4
100	49

b. For each increase in x, the value of y increases by $\frac{1}{2}$. So from 10 to 100, which is a change of 90, there is a change of $\frac{1}{2}$ times 90 or 45.

8. a. $y = x$ and $y = -x$ $(0, 0)$
$y = x + 1$ and $y = -x + 1$ $(0, 1)$
$y = x + 3$ and $y = -x + 3$ $(0, 3)$
$y = x - 4$ and $y = -x - 4$ $(0, -4)$
b. The y-coordinate of the point of intersection is the common constant term in the two equations
c. $(0, 137)$

Figure 1

Line	Constant Rate of Change	y-intercept	x-intercept
A	-1	(0, 3)	(3, 0)
B	1	(0, 2)	$(-2, 0)$
C	2	$(0, -4)$	(2, 0)

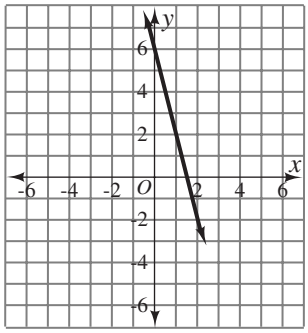
Skill: Linear Functions, Graphs, and Tables

1. a. $y = 0.15x + 0.40$

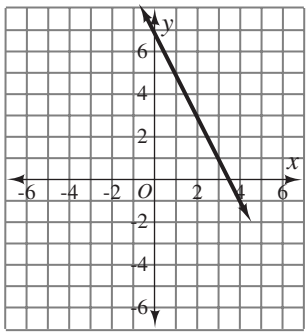
b. 2 miles

c. \$1.60

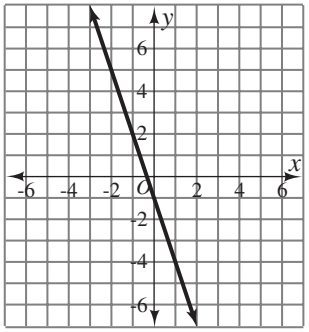
2.



3.



4.



5. A **6.** A, B **7.** B, C **8.** C

9. A **10.** B **11.** C **12.** B

13. $y = -6x$ **14.** $y = x - 7$

15. $y = 3x - 8$ **16.** $y = \frac{1}{2}x + 6$

Investigation 3 Additional Practice

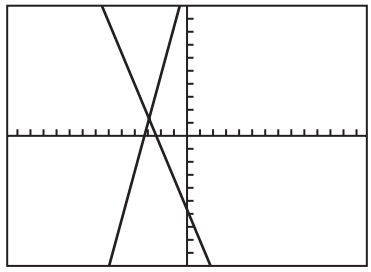
1. a. Equation iii because the point satisfies the equation: $60 = 30 + 1.5(20)$.

b. Answers will vary.

2. a. Equation ii because the point satisfies the equation: $74 = 4.2(10) + 32$.

b. Answers will vary.

3. a. i.



```
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 XMIN=-10
 XMAX=10
 XSCL=1
 YMIN=-10
 YMAX=10
 YSCL=1
```
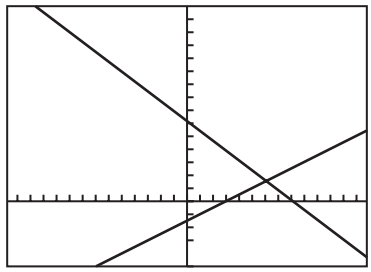
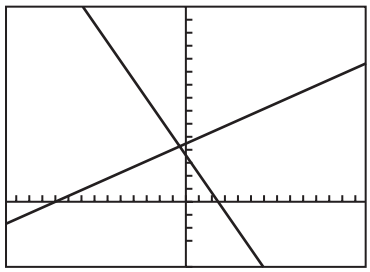

ii.



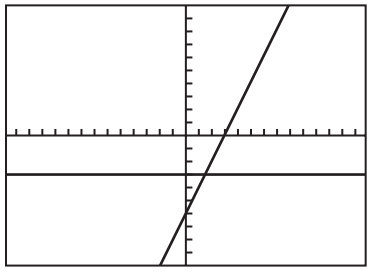
```
WINDOW
 XMIN=-10
 XMAX=10
 XSCL=1
 YMIN=-10
 YMAX=28
 YSCL=2
```

iii.



```
WINDOW
 XMIN=-10
 XMAX=10
 XSCL=1
 YMIN=-10
 YMAX=28
 YSCL=2
```

iv.



```
WINDOW
 XMIN=-10
 XMAX=10
 XSCL=1
 YMIN=-10
 YMAX=10
 YSCL=1
```

b. The exact answers are given here. If students found the intersection points by inspecting the graphs, their answers may not be exact.
i. $(-3.125, 1.5)$ **ii.** $(6, 3)$
iii. $(-0.5, 8.5)$ **iv.** $(2, -2)$

c. The values may not fit exactly because they may be estimates, but they should be close.

4. a. $r = 6$ **b.** $x = 10$
c. $z = 64$ **d.** $w = -187$

5. a. $x + 1$
b. $x + (x + 1) = 41$
c. The equation in part (b) is the same as $2x + 1 = 41$. Subtracting 1 from both sides gives us $2x = 40$, so $x = 20$ and $x + 1 = 21$.

6. a. $24 - 5x = 4; x = 4$
b. $2x + 17 = 7; x = -5$
c. $4x + 14 = 16; x = \frac{1}{2}$
d. $\frac{1}{4}x - 11 = 11; x = 88$

7. a. \$516.25 **b.** \$852
c. \$335.75 profit **d.** 195 people
e. \$493.75 **f.** 91 tickets
g. 273 tickets

8. a. $x = -2$; graph with x-intercept $(-2, 0)$
b. $x = 2$; graph with x-intercept $(2, 0)$
c. $x = -\frac{10}{3}$; graph with x-intercept $(-\frac{10}{3}, 0)$
d. The solution is the x-coordinate of the x-intercept.

9. a. Both strategies are correct.
b. Answers will vary.
c. Dividing is reasonable if all the values are divisible by the same number.
d. $5x = -15$ $\quad x + 4 = 1$
$x = -3$ $\quad x = -3$

10. a. $x = 13$
b. $3x = 13$ so $x = \frac{13}{3}$
c. $-2x = 13$ so $x = \frac{-13}{2}$
d. The numerators of the solutions are all 13; the denominators are the coefficients of x.

11. a. $y = 4$ **b.** $y = 6$ **c.** $y = 10$
d. $y = -2$ **e.** $y = 10\frac{2}{3}$ **f.** $y = 4\frac{1}{3}$

12. a. $x = 15$ **b.** $x = 9$ **c.** $x = 5$
d. $x = 2$ **e.** $x = -4$

Skill: Exploring Equality

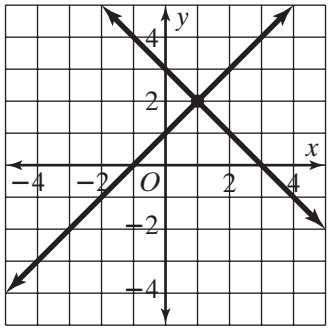
1. a. yes **b.** no **c.** no **d.** yes
2. a. no **b.** yes **c.** yes **d.** yes
3. 1 **4.** 11 **5.** -39 **6.** 137
7. 2; 4; 6; 8 **8.** 4; 7; 10; 13
9. $-4; -3; -2; -1$ **10.** $1; -4; -9; -14$

Moving Straight Ahead Practice Answers

Skill: Finding the Point of Intersection

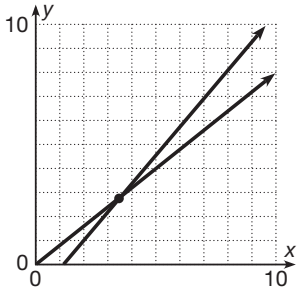
1. yes **2.** no **3.** yes

4. (1, 2);



5. a. $y = 0.8x$; $y = 1.2x - 1.4$

b. $x = 3.5$ pounds



Skill: Solving Linear Equations

1. $h = 3$ **2.** $s = 9$ **3.** $y = 1$

4. $g = 4$ **5.** $j = 2$ **6.** $w = 4$

7. $5 + 2m$; $45

8. $6 + 8w = 30$; 3 weeks

9. 2 **10.** 2 **11.** 1

12. 1 **13.** 7 **14.** −6

15. $100 + 20w = 460$; 18 weeks

16. $50 + 2v = 144$; 47 visits

Investigation 4 Additional Practice

1. a. slope is 2; y-intercept is (0, −10)

b. slope is 4; y-intercept is (0, 3)

c. slope is 4; y-intercept is (0, −4.5)

d. slope is 2.6; y-intercept is (0, 0)

e. slope is 7; y-intercept is (0, 1)

2. i. a. 2.5

b. (0, 0)

c. $y = 2.5x$

ii. a. 1

b. (0, 6)

c. $y = x + 6$

iii. a. 3

b. (0, −1.5)

c. $y = 3x - 1.5$

iv. a. −4

b. (0, 3)

c. $y = 3 - 4x$

v. a. 4

b. (0, −3)

c. $y = 4x - 3$

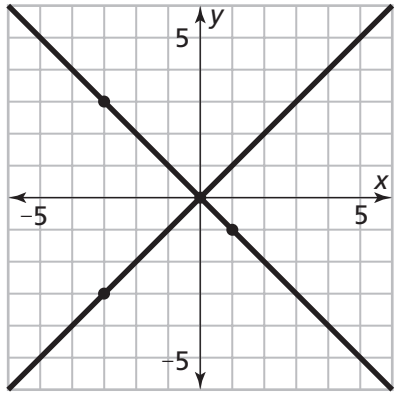
3. a. slope is 1; $y = x$

b. slope is $-\frac{4}{3}$; $y = -\frac{4}{3}x$

c. slope is −3; $y = -3x$

4. a.

line ii line i



b. i. slope = 1

ii. slope = −1

c. i. y-intercept = (0, 0)

ii. y-intercept = (0, 0)

d. i. $y = x$

ii. $y = -x$

5. a. $M = 0.5n + 1.80$

b. 0.5 is slope; It is the cost of each game.

c. 1.80 is the y-intercept; It is the bus fare.

d. $5.80

e. Jim can play 9 games, and he will have $0.45 left over.

6. a. $2.25; This is the intercept on the y-axis, which represents the cost if Angie buys 0 comics.

b. $1.50; For each comic book purchased, the cost rises by $1.50.

c. Using the slope and the y-intercept, the equation is $M = 1.5n + 2.25$.

7. a. 45 gallons; This is the y-intercept (the amount of water in the aquarium at $t = 0$).

b. From the graph, the siphon removes 20 gallons in 12 minutes, or equivalently, $\frac{20}{12} = \frac{5}{3}$ gallons in 1 minute.

c. $G = -\frac{5}{3}t + 45$

d. Substitute 10 for t in the equation. You get $G = 28.33$ gallons of water left in the aquarium.

e. Substitute 0 for G in the equation. You get $t = 27$ minutes.

8. a. $y = 7x - 2$ **b.** $y = 9.18$

c. $y = x - 2$ **d.** $y = 0.5x + 1$

e. $y = \frac{19}{54}x + \frac{43}{12}$ **f.** $y = \frac{10}{3} - \frac{2}{3}x$

9. The equations for the lines are:

L1: $y = 5 - \frac{5}{12}x$ L2: $y = 6 - x$

L3: $y = \frac{4}{5}x + \frac{12}{5}$ L4: $y = \frac{1}{4}x - 10$

10. a. $C = 2.1n + 1.15$

b. 1.15; This is the cost for shoe rental.

c. 2.1; This is the cost of bowling each game.

d. \$13.75

e. Tony bowled 3 games.

11. a. A, E, G

b. A, D, K

c. B, F, L

d. C, D, H

e. C, F, K

12. a. (4, 7); Since the equation of the line is: $y = x + 3$

b. (2, 2); since the equation of the line is: $y = 6 - 2x$

13. a. (Figure 2)

b. The perimeter increases by 2.

c. For the 4 copies you can just look at a picture and find the perimeter or you can see the pattern is increasing by two. For ten copies you know that between 4 and 10 there are 6 columns so it would have increase by 2 six times so there is an increase of 2×6 to the 4 copies column which makes 22 for the 10 copies column. For 100 copies you can do the same thing with this row and the 10 copies row and find out that the ten copies row increased by $2 \times 90 = 180$.

d. 1 square: $P = 2N + 2$, where N = number of copies
2 square: $P = 2N + 4$, where N = number of copies
3 square: $P = 2N + 6$, where N = number of copies
4 square: $P = 2N + 8$, where N = number of copies

14. a. The slopes are the same; the y-intercepts are different.

b. $y = 2x + K$, where K is any number strictly between 2 and 0; for example, $y = 2x + (\frac{1}{3})$.

c. The new line has the same slope so it is parallel to the original two lines; the new constant term is between the original constant terms, so the y-intercept of the new line is between the y-intercept of the original two lines.

Figure 2

Shape	1 Copy	2 Copies	3 Copies	4 Copies	10 Copies	100 Copies
1 square	4	6	8	10	22	202
2 squares	6	8	10	12	24	204
3 squares	8	10	12	14	26	206
4 squares	10	12	14	16	28	208

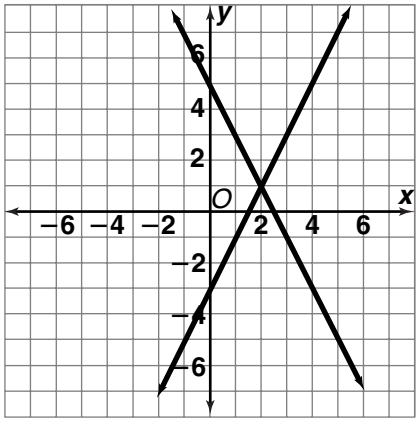
Moving Straight Ahead Practice Answers

Skill: Finding Slope

1. 3 **2.** $-\frac{1}{2}$ **3.** 0

4. $\frac{1}{2}$ **5.** $-\frac{3}{2}$ **6.** 2

7. -2



8. $\frac{2}{5}$ **9.** undefined

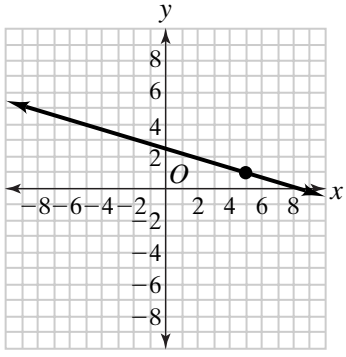
10. 0 **11.** $-\frac{1}{8}$

Skill: Using Slope

1. yes **2.** no **3.** no **4.** no

5. $\frac{1}{6}$ **6.** 2 **7.** $\frac{3}{2}$ **8.** $\frac{1}{16}$

9.



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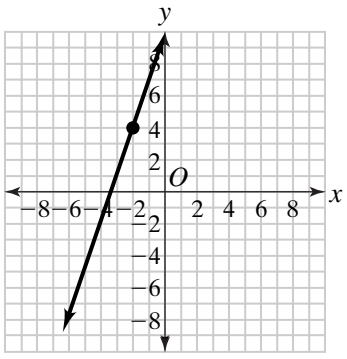

Skill: Writing Equations

1. $y = -2x + 3$ **2.** $y = 3x$

3. $y = -x - 3$ **4.** \$1,000

5. \$75 **6.** 4

7. \$50 **8.** $y = 4x + 100$