**FOMP 10 Final Review Part 2 v1**
**Answer Section**

## SHORT ANSWER

**1.** ANS:
$x^2 + 7x + 12$

PTS: 1 DIF: 1-2 OBJ: Section 5.1 NAT: AN4
TOP: Multiplying Polynomials
KEY: multiplying | binomial by binomial | area model | distributive property

**2.** ANS:
$5(x^2 - 9)$

PTS: 1 DIF: 1-2 OBJ: Section 5.2 NAT: AN5
TOP: Common Factors KEY: factoring | binomial | symbolic

**3.** ANS:
49

PTS: 1 DIF: 1-2 OBJ: Section 5.4 NAT: AN5
TOP: Factoring Special Trinomials KEY: perfect square | trinomial | substitution

**4.** ANS:
Slicers

PTS: 1 DIF: 1-2 OBJ: Section 6.1 NAT: RF1
TOP: Graphs of Relations KEY: interpret a graph

**5.** ANS:
$(x - 8)^2$

PTS: 1 DIF: 1-2 OBJ: Section 5.4 NAT: AN5
TOP: Factoring Special Trinomials KEY: factoring | perfect square | trinomial

**6.** ANS:
$(x - 2)(x - 6)$

PTS: 1 DIF: 1-2 OBJ: Section 5.3 NAT: AN5
TOP: Factoring Trinomials KEY: factoring | trinomial

**7.** ANS:
0

PTS: 1 DIF: 1-2 OBJ: Section 6.4 NAT: RF2
TOP: Functions KEY: evaluate function

**8.** ANS:
line segments AB and IJ
A line segment with a negative slope slants down from left to right. So, only line segments AB and IJ have negative slopes.

PTS: 1 DIF: 1-2 OBJ: Section 6.5 NAT: RF3
TOP: Slope KEY: negative slope | graph

**9.** ANS:
3

$$\text{slope} = \frac{\text{rise}}{\text{run}}$$

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

$$= 3$$

PTS: 1 DIF: 1-2 OBJ: Section 6.5 NAT: RF3
TOP: Slope KEY: calculate slope | rise | run

**10.** ANS:
8

PTS: 1 DIF: 1-2 OBJ: Section 6.5 NAT: RF3
TOP: Slope KEY: rise | ordered pairs

**11.** ANS:
$m$

PTS: 1 DIF: 1-2 OBJ: Section 7.1 NAT: RF6
TOP: Slope-Intercept Form KEY: slope | equation of a line

**12.** ANS:
–6

PTS: 1 DIF: 1-2 OBJ: Section 7.1 NAT: RF6
TOP: Slope-Intercept Form KEY: y-intercept | equation of a line

**13.** ANS:
slope: 2, $y$-intercept: 1

PTS: 1 DIF: 1-2 OBJ: Section 7.1 NAT: RF5
TOP: Slope-Intercept Form KEY: slope | y-intercept | graph

**14.** ANS:
(0, 0)

PTS: 1 DIF: 1-2 OBJ: Section 8.1 NAT: RF9
TOP: Systems of Linear Equations and Graphs
KEY: identify the ordered pair | linear system

**15.** ANS:
(5, –5)

PTS: 1 DIF: 1-2 OBJ: Section 9.1 NAT: RF9
TOP: Solving Systems of Linear Equations by Substitution
KEY: substitution | identify the ordered pair | linear systems

**16.** ANS:
(–7, 6)

PTS: 1 DIF: 1-2 OBJ: Section 9.1 NAT: RF9
TOP: Solving Systems of Linear Equations by Substitution
KEY: substitution | identify the ordered pair | linear systems

**17.** ANS:
21

PTS: 1 DIF: 1-2 OBJ: Section 9.3 NAT: RF9
TOP: Solving Problems Using Systems of Linear Equations
KEY: substitution | identify two numbers | words to equation

**18.** ANS:
greatest common factor *or* GCF

PTS: 1 DIF: 1-2 OBJ: Section 5.2 NAT: AN5
TOP: Common Factors KEY: factoring | GCF

**19.** ANS:

**a)** $m = \frac{\text{rise}}{\text{run}}$

$m = \frac{1}{2}$

**b)** $m = \frac{\text{rise}}{\text{run}}$

$m = \frac{4}{-1}$

$m = -4$

**c)** $m = \frac{\text{rise}}{\text{run}}$

$m = \frac{-3}{-4}$

$m = \frac{3}{4}$

**d)** $m = \frac{\text{rise}}{\text{run}}$

$m = \frac{-10}{-2}$

$m = 5$

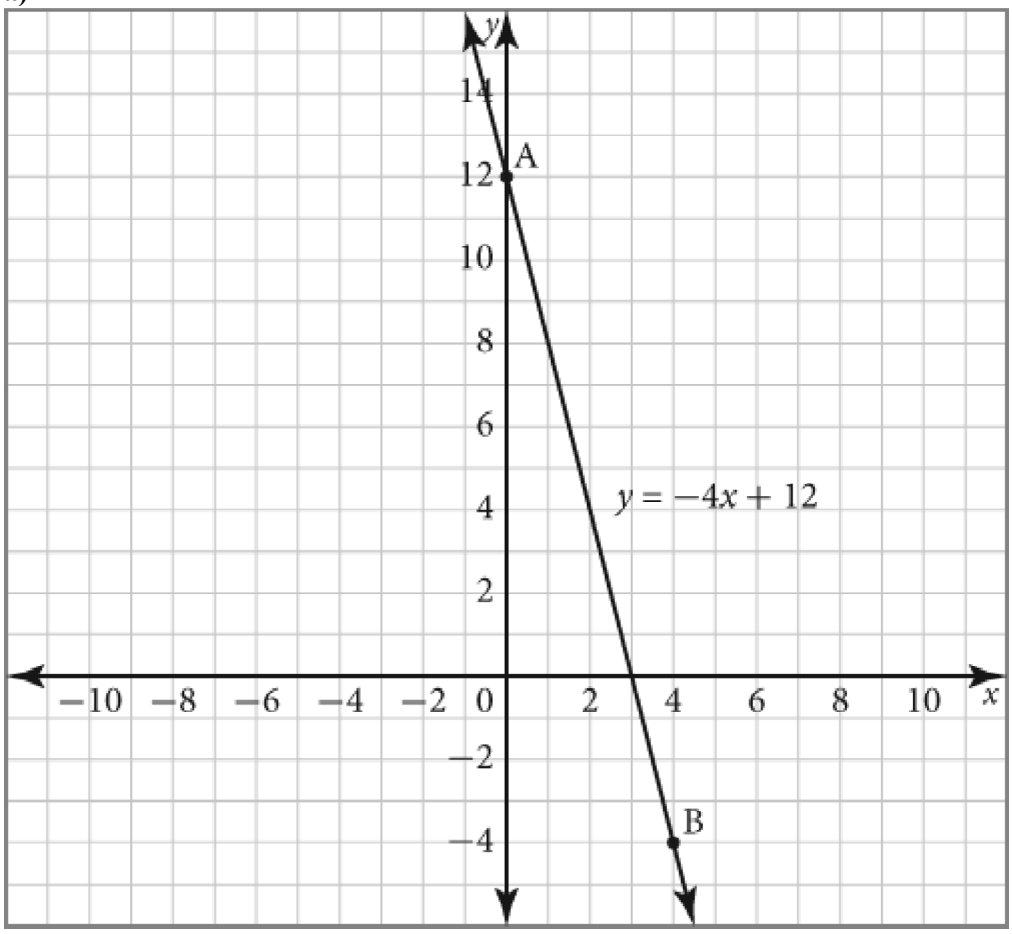
PTS: 1 DIF: 1-2 OBJ: Section 6.5 NAT: RF3
TOP: Slope KEY: slope | rise | run

**20.** ANS:
**a)** The slope is 0.5. It represents the speed at which Sarah walks away from the motion sensor.
**b)** From the graph, Sarah was 3 m from the sensor after about 4 s.

PTS: 1 DIF: 1-2 OBJ: Section 6.1 | Section 6.5
NAT: RF1| RF3 TOP: Graphs of Relations | Slope KEY: interpret a graph | slope

**21.** ANS:

**a)**




**b)** $m = \dfrac{\text{rise}}{\text{run}}$

$m = \dfrac{-4-12}{4-0}$

$m = \dfrac{-16}{4}$

$m = -4$

**c)**

| $x$ | $y$ |
|---|---|
| 0 | 8 |
| 1 | 4 |
| 2 | 0 |
| 3 | −4 |
| 4 | −8 |

PTS: 1 DIF: 1-2 OBJ: Section 6.5 NAT: RF3
TOP: Slope KEY: create a graph | table of values | slope

**22.** ANS:
straight line

PTS: 1 DIF: 1-2 OBJ: Section 6.1 NAT: RF1
TOP: Graphs of Relations KEY: linear relation

**23.** ANS:
**a)** From the graph, the amount of money that Jamie started with is $120.

**b)** Since Jamie spends $15 each month, the rate of change is –15. The slope is the same as the rate of change so the slope is –15.

**c)** From the graph the amount of money remaining at 8 months is 0, so it will not last the entire school year.

PTS: 1 DIF: 1-2 OBJ: Section 6.1 | Section 6.5
NAT: RF1 | RF3 TOP: Graphs of Relations | Slope KEY: interpret a graph | slope

**24.** ANS:
curve

PTS: 1 DIF: 1-2 OBJ: Section 6.1 NAT: RF1
TOP: Graphs of Relations KEY: non-linear relation

**25.** ANS:
discrete

PTS: 1 DIF: 1-2 OBJ: Section 6.2 NAT: RF1
TOP: Linear Relations KEY: linear relation | discrete data

**26.** ANS:
*m; b*

PTS: 1 DIF: 1-2 OBJ: Section 7.1 NAT: RF6
TOP: Slope-Intercept Form
KEY: equation of a line | slope-intercept form | slope | y-intercept

**27.** ANS:
$y = 0$

PTS: 1 DIF: 1-2 OBJ: Section 7.2 NAT: RF5
TOP: General Form KEY: x-intercept

**28.** ANS:
Let $x$ and $y$ represent the numbers.
$3x + y = 39$ ①
$2x - y = 6$ ②
Add equation ① and equation ②:

$$\begin{array}{r} 3x + y = 39 \\ +\ (2x - y = 6) \\ \hline 5x = 45 \\ x = 9 \end{array}$$

Substitute $x = 9$ into equation ①:
$3x + y = 39$
$3(9) + y = 39$
$27 + y = 39$
$y = 12$
The two numbers are 9 and 12.

PTS: 1 DIF: 1-2 OBJ: Section 9.2 NAT: RF9
TOP: Solving Systems of Linear Equations by Elimination
KEY: substitution | identify two numbers | words to equation

**29.** ANS:
$6x^2 - 24x + 24$

PTS: 1 DIF: 3-4 OBJ: Section 5.1 NAT: AN4
TOP: Multiplying Polynomials
KEY: multiplying | binomial by binomial | distributive property | surface area

**30.** ANS:
$(5v + 3x)(w + 1)$

PTS: 1 DIF: 3-4 OBJ: Section 5.1 NAT: AN5
TOP: Multiplying Polynomials KEY: factoring | symbolic

**31.** ANS:
$-2(7x^2 - 6x + 4)$

PTS: 1 DIF: 3-4 OBJ: Section 5.2 NAT: AN5
TOP: Common Factors KEY: factoring | trinomial | symbolic

**32.** ANS:
$-9(11x^2 - 5x - 5)$

PTS: 1 DIF: 3-4 OBJ: Section 5.2 NAT: AN5
TOP: Common Factors KEY: factoring | trinomial | symbolic

**33.** ANS:
$\{x | x \in \mathrm{R}\}$

PTS: 1 DIF: 3-4 OBJ: Section 6.3 NAT: RF8
TOP: Domain and Range KEY: domain | set notation

**34.** ANS:
$6x + 9$ and $6x - 9$

PTS: 1 DIF: 3-4 OBJ: Section 5.4 NAT: AN5
TOP: Factoring Special Trinomials KEY: area | factoring | difference of squares

**35.** ANS:
2 and –6

PTS: 1 DIF: 3-4 OBJ: Section 5.3 NAT: AN5
TOP: Factoring Trinomials KEY: multiplying | adding | factors

**36.** ANS:
$(x + 28)(x + 3)$

PTS: 1 DIF: 3-4 OBJ: Section 5.3 NAT: AN5
TOP: Factoring Trinomials KEY: factoring | trinomial

**37.** ANS:
$(2x + 10)(x + 5)$

PTS: 1 DIF: 3-4 OBJ: Section 5.3 NAT: AN5
TOP: Factoring Trinomials KEY: factoring | trinomial

**38.** ANS:
$\frac{1}{2}$

PTS: 1 DIF: 3-4 OBJ: Section 6.5 NAT: RF3
TOP: Slope KEY: rise | ordered pairs

**39.** ANS:
0

PTS: 1 DIF: 3-4 OBJ: Section 7.1 NAT: RF6
TOP: Slope-Intercept Form KEY: y-intercept | equation of a line

**40.** ANS:
$y = \frac{1}{4}x - 4$

PTS: 1 DIF: 3-4 OBJ: Section 7.4 NAT: RF7
TOP: Parallel and Perpendicular Lines KEY: parallel lines | equation of a line | graph

**41.** ANS:
zero

PTS: 1 DIF: 3-4 OBJ: Section 7.2 NAT: RF1
TOP: General Form KEY: general form | constraints

**42.** ANS:
slope: –4, $y$-intercept: –4

PTS: 1 DIF: 3-4 OBJ: Section 7.2 NAT: RF6
TOP: General Form KEY: slope-intercept form | slope | y-intercept

**43.** ANS:
$2x - y + 5 = 0$

PTS: 1 DIF: 3-4 OBJ: Section 7.2 NAT: RF7
TOP: General Form KEY: equation of a line | general form | slope | y-intercept

**44.** ANS:
$y = x - 4$

PTS: 1 DIF: 3-4 OBJ: Section 7.3 NAT: RF7
TOP: Slope-Point Form KEY: equation of a line given two points

**45.** ANS:
$y = 4x + 5$

PTS: 1 DIF: 3-4 OBJ: Section 7.3 NAT: RF7
TOP: Slope-Point Form KEY: equation of a line given the slope and a point

**46.** ANS:
$y = 4x + 7$
The line must also have slope 4. Substitute the slope and the coordinates of the point (5, 27) into the equation $y = mx + b$ and solve for $b$:

$$27 = (4)(5) + b$$
$$+ 7 = b$$

The equation of the line is $y = 4x + 7$.

PTS: 1 DIF: 3-4 OBJ: Section 7.4 NAT: RF7
TOP: Parallel and Perpendicular Lines
KEY: parallel lines | equation of a line given the slope and a point

**47.** ANS:
(–17, –19)

PTS: 1 DIF: 3-4 OBJ: Section 9.1 NAT: RF9
TOP: Solving Systems of Linear Equations by Substitution
KEY: substitution | identify the ordered pair | linear systems

**48.** ANS:
(–1, 0)

PTS: 1 DIF: 3-4 OBJ: Section 9.1 NAT: RF9
TOP: Solving Systems of Linear Equations by Substitution
KEY: substitution | identify the ordered pair | linear systems

**49.** ANS:
(3, 1)

PTS: 1 DIF: 3-4 OBJ: Section 9.1 NAT: RF9
TOP: Solving Systems of Linear Equations by Substitution
KEY: substitution | identify the ordered pair | linear systems

**50.** ANS:
–4 and 21

PTS: 1 DIF: 3-4 OBJ: Section 9.2 NAT: RF9
TOP: Solving Systems of Linear Equations by Elimination
KEY: elimination | identify two numbers | words to equation

**51.** ANS:
(7, 8)

PTS: 1 DIF: 3-4 OBJ: Section 9.2 NAT: RF9
TOP: Solving Systems of Linear Equations by Elimination
KEY: elimination | identify the ordered pair | linear systems

**52.** ANS:
**a)** $49x^2 - 36 = (7x)^2 - (6)^2$
$= (7x + 6)(7x - 6)$
The dimensions of the screen are $7x + 6$ by $7x - 6$.

**b)** Substitute $x = 90$ into the length and width.
$l = 7x + 6$
$l = 7(90) + 6$
$l = 630 + 6$
$l = 636$
$w = 7x - 6$
$w = 7(90) - 6$
$w = 630 - 6$
$w = 624$
The screen measures 636 cm long by 624 cm wide.

**c)** $P = 2l + 2w$
$P = 2(636) + 2(624)$
$P = 1272 + 1248$
$P = 2520$
The perimeter of the screen is 2520 cm.

PTS: 1 DIF: 3-4 OBJ: Section 5.4 NAT: AN5
TOP: Factoring Special Trinomials
KEY: area | difference of squares | factoring | perimeter | substitution

**53.** ANS:
15

PTS: 1 DIF: 3-4 OBJ: Section 9.3 NAT: RF9
TOP: Solving Problems Using Systems of Linear Equations KEY: substitution | scenario

**54.** ANS:
$\left(\frac{4}{3}, \frac{14}{3}\right)$

PTS: 1 DIF: 3-4 OBJ: Section 9.1 NAT: RF9
TOP: Solving Systems of Linear Equations by Substitution
KEY: substitution | identify the ordered pair | fraction solution | linear systems

**55.** ANS:
**a)** This is a linear relation. With each increase of 1 in the independent variable, $x$, the dependent variable, $y$, increases by 2.

**b)** This is a non-linear relation.With each increase of 1 in the independent variable, $r$, the dependent variable, $A$, does not increase by the same amount. It increases by the square of the increase in $r^2$.

**c)** This is a linear relation. With each increase of 3 in the independent variable, $x$, the dependent variable, $y$, decreases by 2.

PTS: 1 DIF: 3-4 OBJ: Section 6.2 NAT: RF4
TOP: Linear Relations KEY: linear relation | non-linear relation

**56.** ANS:
2; 2; $y = 2x + 2$

PTS: 1 DIF: 3-4 OBJ: Section 7.1 NAT: RF7
TOP: Slope-Intercept Form
KEY: equation of a line given two points | slope | y-intercept | ordered pairs

**57.** ANS:
$\frac{4}{5}$

PTS: 1 DIF: 3-4 OBJ: Section 7.3 NAT: RF6
TOP: Slope-Point Form KEY: slope | slope-point form

**58.** ANS:

**a)** Jim started 2680 ft above ground and travelled 40 ft/min.
The equation $h = 2680 - 40t$ represents Jim's height above the ground.

**b)**

| $t$ | $h$ |
|---|---|
| 0 | 2680 |
| 1 | 2640 |
| 2 | 2600 |
| 3 | 2560 |
| 4 | 2520 |

**c)** Substitute $t = 30$ into the equation $h = 2680 - 40t$:
$h = 2680 - 40(30)$
$h = 1480$
Jim was 1480 ft above the ground after 30 min.

**d)** Substitute $h = 0$ into the equation $h = 2680 - 40t$:
$h = 2680 - 40t$
$0 = 2680 - 40t$
$t = 67$
It took Jim 67 min to reach the ground.

PTS: 1 DIF: 3-4 OBJ: Section 7.1 NAT: RF7
TOP: Slope-Intercept Form
KEY: table of values | slope-intercept form | height | problem solving

**59.** ANS:

**a)** The government taxes Gina one-third of her 18% commission, which is equivalent to 6% of Gina's sales for the day.
$E = 0.18S + 0.06S$
$E = 0.12S$

**b)** Substitute $S = 1200$ into the equation from part a):
$E = 0.12(1200)$
$E = 144$
Gina's earnings are \$144 after taxes if her sales are \$1200 in one day.

**c)** Substitute $E = 264$ into the equation from part a):
$264 = 0.12S$
$S = 2200$
Gina's sales would have to be \$2200 for her to earn \$264 in one day, after taxes.

PTS: 1 DIF: 3-4 OBJ: Section 7.1 NAT: RF7
TOP: Slope-Intercept Form
KEY: equation of a line | slope-intercept form | tax | commission | earnings | sales

**60.** ANS:

**a)** The slope is $\frac{6}{5}$ and represents the distance, in metres, Christine walks away from the motion sensor in 1 s.

The $d$-intercept is 2 and represents the distance, in metres, Christine was from the motion sensor when she started walking.

**b)** $d = \frac{6}{5}t + 2$

**c)** Substitute $d = 6$ into the equation from part b):

$d = \frac{6}{5}t + 2$

$6 = \frac{6}{5}t + 2$

$t = \frac{6 - 2}{6/5}$

$t = \frac{10}{3}$ s

Sarah was 6 m from the sensor after approximately 3.3 s.

PTS: 1 DIF: 3-4 OBJ: Section 7.1 NAT: RF6 | RF7
TOP: Slope-Intercept Form KEY: distance-time | graph | slope-intercept form

**61.** ANS:

**a)** $C = 2t + 3$

**b)** Substitute $t = 24$ into the equation $C = 2t + 3$:
$C = 2(24) + 3$
$C = 51$
It will cost Danny $51 to park his car for 24 h.

**c)** Substitute $C = 27.00$ into the equation $C = 2t + 3$:
$27.00 = 2t + 3$
$t = 12$
Danny can park his car for 12 h if he has $27.00.

PTS: 1 DIF: 3-4 OBJ: Section 7.1 NAT: RF7
TOP: Slope-Intercept Form KEY: equation of a line | slope-intercept form | cost

**62.** ANS:

Example: To solve a linear system by substitution, solve the first equation for one variable, and then substitute that expression into the second equation and solve for the second variable. Substitute the value of the second variable into one of the equations and solve for the value of the first variable.

PTS: 1 DIF: 3-4 OBJ: Section 9.1 NAT: RF9
TOP: Solving Systems of Linear Equations by Substitution KEY: substitution | linear systems

**63.** ANS:

**a)** $x - 2y = 7$ ①

$y = -x + 1$ ②

Substitute equation ② into equation ①:

$$x - 2y = 7$$

$$x - 2(-x + 1) = 7$$

$$x + 2x - 2 = 7$$

$$3x - 2 = 7$$

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

$$3x = 9$$

$$\frac{3x}{3} = \frac{9}{3}$$

$$x = 3$$

Substitute the value for $x$ into equation ②:

$y = -x + 1$

$y = -3 + 1$

$y = -2$

The solution to the linear system is $(3, -2)$.

**b)** $x + 3y = 5$ ①

$-2x + y = 4$ ②

Solve equation ② for $y$:

$$-2x + y = 4$$

$$-2x + y + 2x = 4 + 2x$$

$$y = 4 + 2x$$

Substitute $y = 4 + 2x$ into equation ①:

$$x + 3y = 5$$

$$x + 3(4 + 2x) = 5$$

$$x + 12 + 6x = 5$$

$$7x + 12 = 5$$

$$7x + 12 - 12 = 5 - 12$$

$$7x = -7$$

$$\frac{7x}{7} = \frac{-7}{7}$$

$$x = -1$$

Substitute the value for $x$ into equation ①:

$$x + 3y = 5$$

$$-1 + 3y = 5$$

$$-1 + 3y + 1 = 5 + 1$$

$$3y = 6$$

$$\frac{3y}{3} = \frac{6}{3}$$

$$y = 2$$

The solution to the linear system is (–1, 2).

**c)** $-x + 3y + 1 = 0$ ①
$3x - y + 1 = 0$ ②
Solve equation ② for $y$:

$$3x - y + 1 = 0$$

$$3x - y + 1 + y = 0 + y$$

$$3x + 1 = y$$

Substitute $y = 3x + 1$ into equation ①:

$$-x + 3y + 1 = 0$$

$$-x + 3(3x + 1) + 1 = 0$$

$$-x + 9x + 3 + 1 = 0$$

$$8x + 4 = 0$$

$$8x + 4 - 4 = 0 - 4$$

$$8x = -4$$

$$\frac{8x}{8} = \frac{-4}{8}$$

$$x = -\frac{1}{2}$$

Substitute this value for $x$ into equation ①:

$$-x + 3y + 1 = 0$$
$$-\left(-\frac{1}{2}\right) + 3y + 1 = 0$$
$$\frac{1}{2} + 3y + 1 = 0$$
$$3y + \frac{3}{2} = 0$$
$$3y + \frac{3}{2} - \frac{3}{2} = 0 - \frac{3}{2}$$
$$3y = -\frac{3}{2}$$
$$\frac{3y}{3} = -\frac{3}{2} \times \frac{1}{3}$$
$$y = -\frac{1}{2}$$

The solution to the linear system is $\left(-\frac{1}{2}, -\frac{1}{2}\right)$.

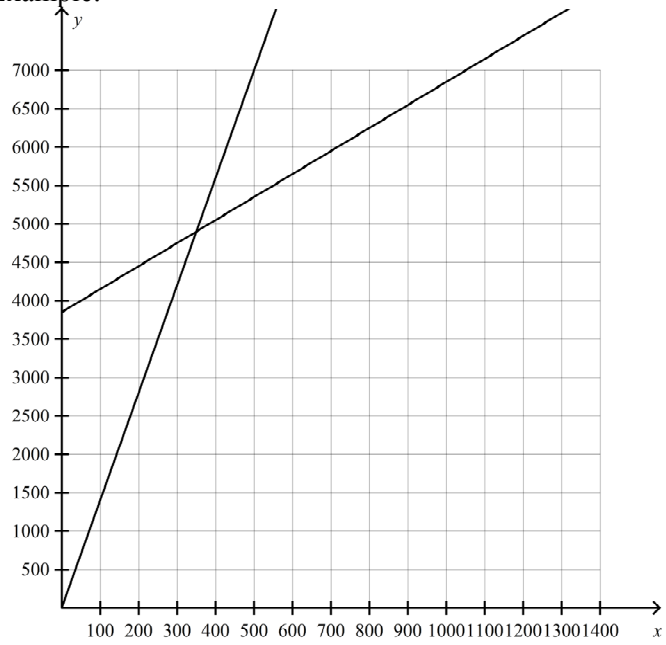
**d)** $4x - 3y = -13$ ①
$-2x + y = 4$ ②
Solve equation ② for $y$:
$$-2x + y = 4$$
$$-2x + y + 2x = 4 + 2x$$
$$y = 4 + 2x$$
Substitute $y = 4 + 2x$ into equation ①:
$$4x - 3y = -13$$
$$4x - 3(4 + 2x) = -13$$
$$4x - 12 - 6x = -13$$
$$-2x - 12 = -13$$
$$-2x - 12 + 12 = -13 + 12$$
$$-2x = -1$$
$$\frac{-2x}{-2} = \frac{-1}{-2}$$
$$x = \frac{1}{2}$$
Substitute this value for $x$ into equation ②:

$$-2x + y = 4$$
$$-2\left(\frac{1}{2}\right) + y = 4$$
$$-1 + y = 4$$
$$-1 + y + 1 = 4 + 1$$
$$y = 5$$

The solution to the linear system is $\left(\frac{1}{2}, 5\right)$.

PTS: 1 DIF: 3-4 OBJ: Section 9.1 NAT: RF9
TOP: Solving Systems of Linear Equations by Substitution
KEY: substitution | identify the ordered pair | fraction solution | linear systems

**64.** ANS:
Let $x$ represent the number of CDs, and let $y$ represent the amounts of money, in dollars.
Total Cost: $y = 3x + 3850$
Revenue: $y = 14x$
Example:




The graphs intersect at (350, 4900). This is where they will break even. The band must sell more than 350 CDs to make a profit.

PTS: 1 DIF: 3-4 OBJ: Section 8.2 NAT: RF9
TOP: Modelling and Solving Linear Systems
KEY: identify the linear system | graph | identify the ordered pair

**65.** ANS:

**a)** Let $x$ represent the cost of a ticket in Section A, and let $y$ represent the cost of a ticket in Section B, both in dollars.

$6x + 10y = 290$ ①

$4x + 8y = 220$ ②

**b)** Multiply equation ① by 2, and multiply equation ② by 3, then subtract them:

$$\begin{array}{r} 12x + 20y = 580 \\ \underline{-\,(12x + 24y = 660)} \\ -4y = -80 \\ y = 20 \end{array}$$

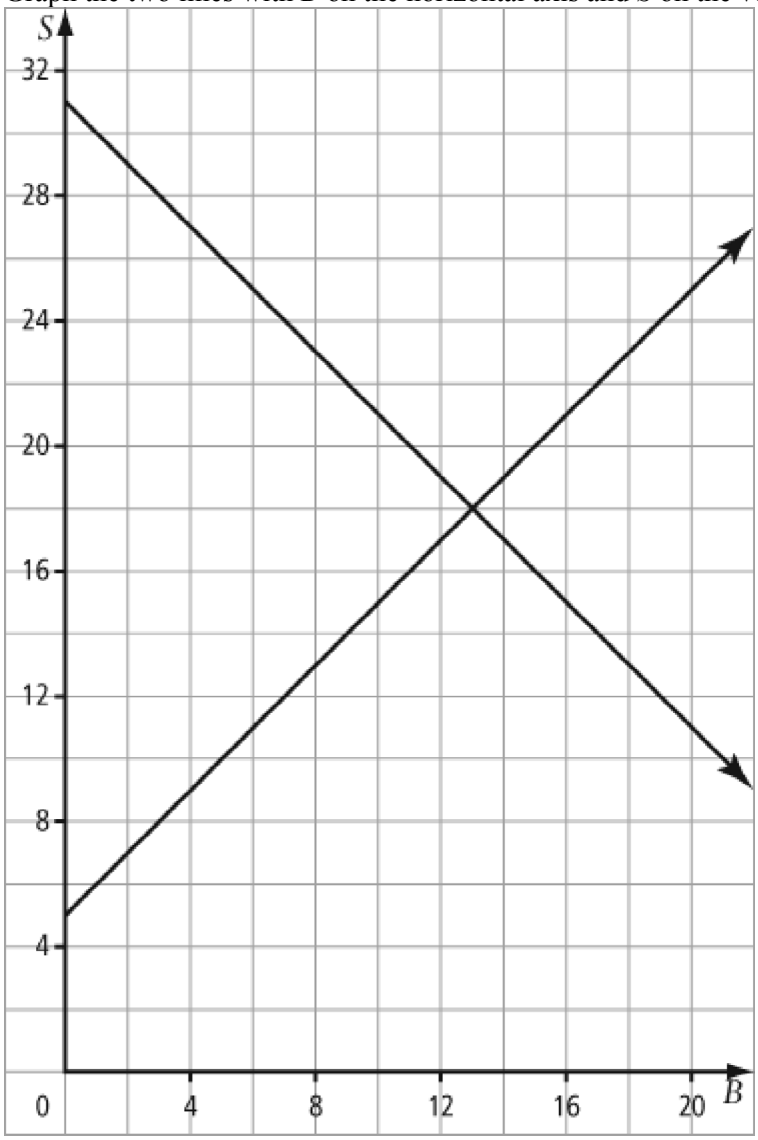
Substitute $y = 20$ into equation ①:

$$\begin{array}{r} 6x + 10y = 290 \\ 6x + 10(20) = 290 \\ 6x + 200 = 290 \\ 6x = 90 \\ x = 15 \end{array}$$

The price of a ticket in Section A is \$15, and the price of a ticket in Section B is \$20.

PTS: 1 DIF: 3-4 OBJ: Section 9.3 NAT: RF9
TOP: Solving Problems Using Systems of Linear Equations KEY: elimination | scenario

**66.** ANS:
Let $S$ represent the number of fish that Stephanie has, and let $B$ represent the number of fish that Brett has.
$S = 5 + B$
$S + B = 31$ or $S = 31 - B$
Graph the two lines with $B$ on the horizontal axis and $S$ on the vertical axis.

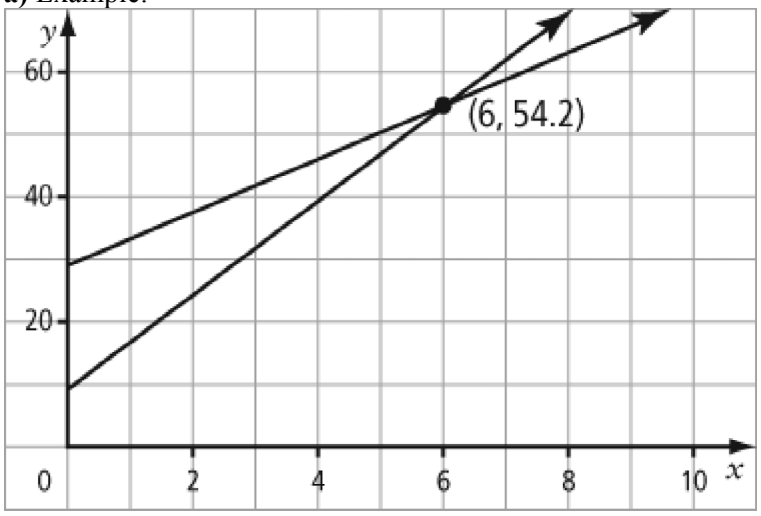



From the graph, the intersection point is (13, 18). This means that Brett has 13 fish and Stephanie has 18.

PTS: 1 DIF: 3-4 OBJ: Section 8.2 NAT: RF9
TOP: Modelling and Solving Linear Systems
KEY: identify the linear system | graph | identify the ordered pair

**67.** ANS:

**a)** Example:




The graphs intersect at (6, 54.2). After 6 years online sales will exceed in-store sales.

**b)** After 6 years, the online and in-store sales are the same ($54,200).

PTS: 1 DIF: 3-4 OBJ: Section 8.2 NAT: RF9
TOP: Modelling and Solving Linear Systems
KEY: graph | identify the ordered pair | interpret solution

**68.** ANS:

True

Example: Linear systems can intersect in only one of three ways:
1) one point of intersection – the lines cross
2) no points of intersection – the lines are parallel
3) an infinite number of points of intersection – the lines are coincident
The only time lines have two or more points of intersection is when they are coincident. This means that they have an infinite number of points of intersection.

PTS: 1 DIF: 3-4 OBJ: Section 8.3 NAT: RF9
TOP: Number of Solutions for Systems of Linear Equations
KEY: infinite number | number of solutions | linear system

**69.** ANS:

36

PTS: 1 DIF: 5-6 OBJ: Section 5.4 NAT: AN5
TOP: Factoring Special Trinomials KEY: perfect square | trinomial | substitution

**70.** ANS:
$680
Substitute the known values into the equation $A = P + Prt$:
$A = P + Prt$
$A = 400 + (400)(0.05)(14)$
The value of the investment after 14 years is $680.

PTS: 1 DIF: 5-6 OBJ: Section 7.1 NAT: RF5
TOP: Slope-Intercept Form KEY: slope-intercept form | interest | problem solving

**71.** ANS:
slope: –2, $y$-intercept: $-\frac{5}{3}$

PTS: 1 DIF: 5-6 OBJ: Section 7.2 NAT: RF6
TOP: General Form KEY: slope-intercept form | slope | y-intercept

**72.** ANS:
–2

PTS: 1 DIF: 5-6 OBJ: Section 7.3 NAT: RF3
TOP: Slope-Point Form KEY: slope | problem solving

**73.** ANS:
2
Substitute the coordinates of the $x$-intercept, (4, 0), into the equation and solve for $p$:
$px + 4y + 4 = 0$
$p(-2) + 4(0) + 4 = 0$
$p(-2) + 4 = 0$
The value of $p$ is 2.

PTS: 1 DIF: 5-6 OBJ: Section 7.2 NAT: RF6
TOP: General Form KEY: x-intercept | general form | equation of a line

**74.** ANS:
$y = 2x - 6$

PTS: 1 DIF: 5-6 OBJ: Section 7.3 NAT: RF7
TOP: Slope-Point Form KEY: equation of a line given two points | table of values

**75.** ANS:
$y = 2x - 4$
The line must have slope 2. Identify the $x$-intercept of $4x - 7y = 8$.
Substitute $y = 0$:
$4x - 7(0) = 8$
$x = 2$
The point (2, 0) is on the line.
$y = mx + b$
$0 = (2)(2) + b$
$-4 = b$
The equation of the line is $y = 2x - 4$.

PTS: 1 DIF: 5-6 OBJ: Section 7.4 NAT: RF7
TOP: Parallel and Perpendicular Lines
KEY: parallel lines | slope | equation of a line given the slope and a point

**76.** ANS:
$y = \frac{3}{2}x + \frac{1}{5}$

PTS: 1 DIF: 5-6 OBJ: Section 8.1 NAT: RF9
TOP: Systems of Linear Equations and Graphs KEY: rewrite in slope-intercept form

**77.** ANS:
$\left(\frac{13}{3}, \frac{5}{3}\right)$

PTS: 1 DIF: 5-6 OBJ: Section 8.1 NAT: RF9
TOP: Systems of Linear Equations and Graphs
KEY: identify the ordered pair | linear system

**78.** ANS:
$391.00

PTS: 1 DIF: 5-6 OBJ: Section 9.3 NAT: RF9
TOP: Solving Problems Using Systems of Linear Equations KEY: substitution | scenario

**79.** ANS:
$15 000.00 at 3.6% and $25 000.00 at 4.8%

PTS: 1 DIF: 5-6 OBJ: Section 9.3 NAT: RF9
TOP: Solving Problems Using Systems of Linear Equations
KEY: substitution | simple interest | scenario

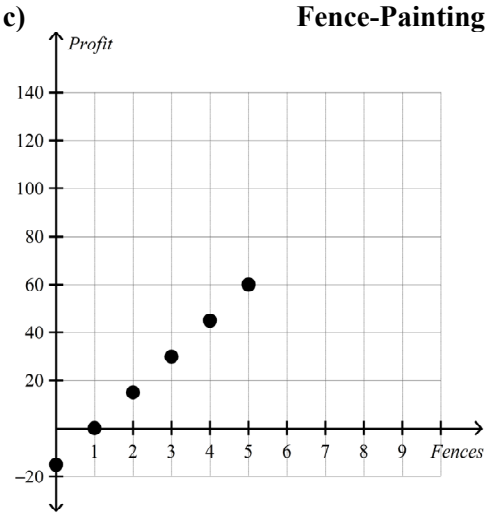
**80.** ANS:

**a)**

| Fences Painted | Profit ($) |
|---|---|
| 0 | –15 |
| 1 | 0 |
| 2 | 15 |
| 3 | 30 |
| 4 | 45 |
| 5 | 60 |

**b)** The relation is linear, because for every increase in the number of fences painted, the profit increases by a constant amount of $15.

**c)**




The data are discrete, as there is no payment for a partially painted fence

**d)** Extrapolating the graph, we see that Clark would have to paint 18 fences to make $255.

PTS: 1 DIF: 5-6 OBJ: Section 6.1 | Section 6.2
NAT: RF1 | RF2 TOP: Graphs of Relations | Linear Relations
KEY: discrete relation | graph points | extrapolate from graph

**81.** ANS:

**a)** –2

**b)** –4

**c)** $y = -2x - 4$

PTS: 1 DIF: 5-6 OBJ: Section 6.5 NAT: RF3
TOP: Slope KEY: slope of a line | y-intercept | equation of a line

**82.** ANS:

A parallel line is needed, so the other equation must be $y = -\frac{1}{3}x + b$ where $b$ can be any value except 6.

PTS: 1 DIF: 5-6 OBJ: Section 8.3 NAT: RF9
TOP: Number of Solutions for Systems of Linear Equations
KEY: linear system | no solution | parallel lines | identify the equation

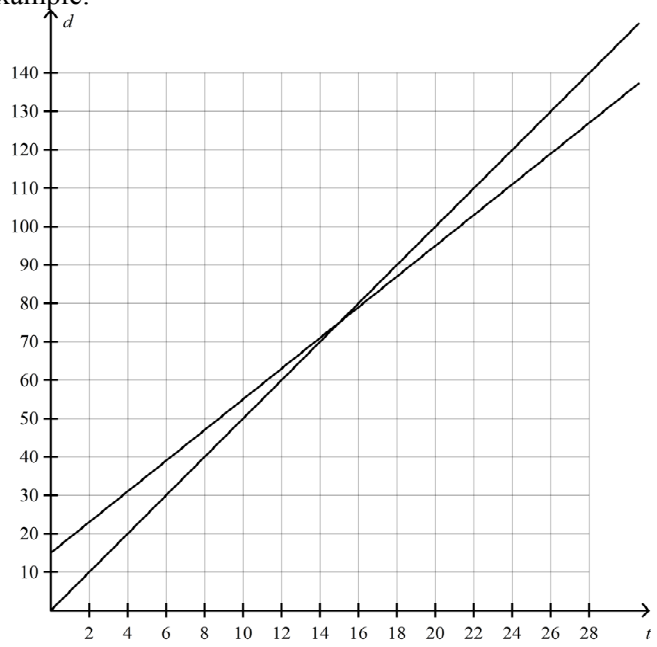
**83.** ANS:

**a)** Let $f$ be the speed of the fishing boat, and let $c$ be the speed of the river's current, both in km/h.
Upstream:
$40 = (f - c)5$
$f - c = 8$ ①
Downstream:
$40 = (f + c)4$
$f + c = 10$ ②
Add equation ① and equation ②:
$f - c = 8$
$+ (f + c = 10)$
$f = 9$
The speed of the fishing boat is 9 km/h.

**b)** Substitute $f = 9$ into equation ②:
$9 + c = 10$
$c = 1$
The river's current is 1 km/h.

PTS: 1 DIF: 5-6 OBJ: Section 9.3 NAT: RF9
TOP: Solving Problems Using Systems of Linear Equations
KEY: distance | speed | time | substitution | elimination | scenario

**84.** ANS:
Let $t$ represent the number of T-shirts, and let $d$ represent the amount of money, in dollars. The linear system that represents this situation is:
Cost: $d = 15 + 4t$
Revenue: $d = 5t$
Example:




Chandra must print 15 T-shirts for the school to break even.

PTS: 1 DIF: 5-6 OBJ: Section 8.2 NAT: RF9
TOP: Modelling and Solving Linear Systems
KEY: identify the linear system | graph | identify the ordered pair

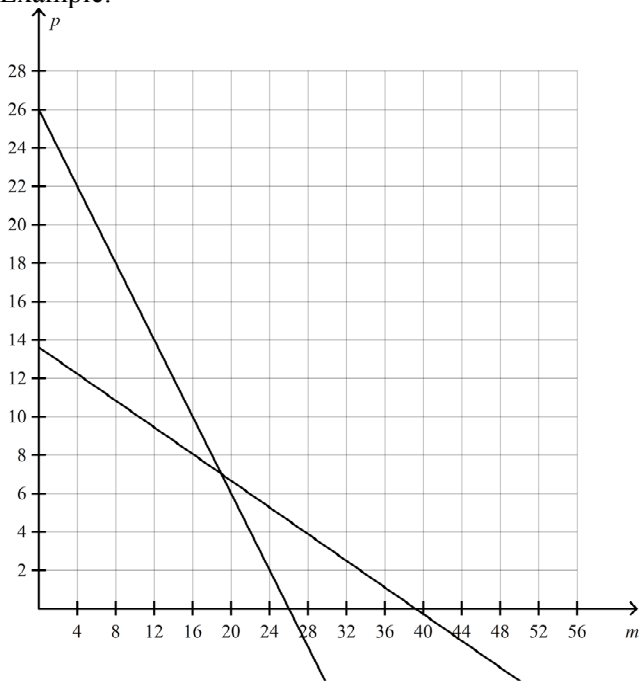
**85.** ANS:
Let $x$ represent the mass of dried cranberries in the snack bars and let $y$ represent the mass of raisins, both in kilograms.
$y = 3.5x$ ①
$8.50x + 7.00y = 297.00$ ②
Substitute equation ① into equation ②:
$8.50x + 7.00(3.5x) = 297.00$
$x = 9$
Substitute $x = 9$ into equation ①:
$y = 3.5(9)$
$y = 31.5$
Adam and Tanya need to buy 9 kg of dried cranberries and 31.5 kg of raisins for their snack bars.

PTS: 1 DIF: 5-6 OBJ: Section 9.3 NAT: RF9
TOP: Solving Problems Using Systems of Linear Equations KEY: substitution | scenario

**86.** ANS:

**a)** Let $p$ represent the number of laser printers and $m$ represent the number of monitors. The two equations are $26 = p + m$ and $7825 = 575p + 200m$.

**b)** Example:




The graphs intersect at (19, 7). The shipment consists of 19 monitors and 7 printers.

PTS: 1 DIF: 5-6 OBJ: Section 8.2 NAT: RF9
TOP: Modelling and Solving Linear Systems
KEY: identify the linear system | graph | identify the ordered pair

**87.** ANS:

–2, 4, 8

PTS: 1 DIF: 7-8 OBJ: Section 9.3 NAT: RF9
TOP: Solving Problems Using Systems of Linear Equations
KEY: three variables | substitution | words to equation

**88.** ANS:

**a)** Determine the cost of one jersey including the tax of 12%.
Cost = 31 + 3.72
The cost of one jersey is $34.72.
The cost of $j$ jerseys can be represented by $34.72j$.
Determine the cost of the storage box including the tax of 12%.
Cost = 93 + 11.16
The storage box costs $104.16.
The amount of money that remains in the budget can be represented by the function
$B(j) = 520.80 – 104.16 – 34.72j$
$B(j) = 416.64 - 34.72j$

**b)**

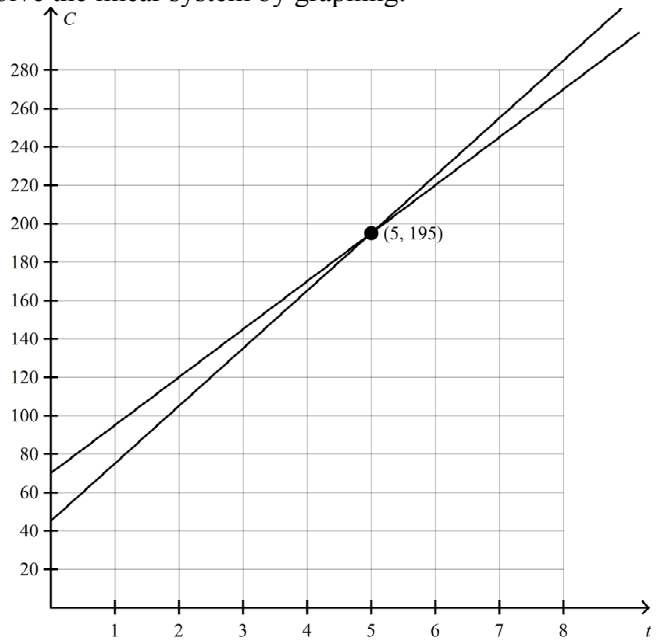
| $j$ | $B(j)$ |
|---|---|
| 0 | 416.64 |
| 1 | 381.92 |
| 2 | 347.20 |
| 3 | 312.48 |
| 4 | 277.76 |

**c)** Substitute $j = 8$ into the equation $B(j) = 416.64 – 34.72j$.
$B(8) = 138.88$
Therefore $138.88 remains in the budget after Robert buys 8 jerseys.

**d)** Substitute $B(j) = 0$ into the equation $B(j) = 416.64 – 34.72j$.
$0 = 416.64 – 34.72j$
$j = 12$
Robert can buy 12 jerseys with his budget.

PTS: 1 DIF: 7-8 OBJ: Section 6.1 | Section 6.2 | Section 6.4
NAT: RF1 | RF2 | RF4 | RF8 TOP: Graphs of Relations | Linear Relations | Functions
KEY: interpret a situation | function notation | equation of a line | table of values

**89.** ANS:
Let $C$ represent the total charge, in dollars, and $t$ represent time, in hours.
Candace: $C = 30t + 45$
Dino: $C = 25t + 70$
Solve the linear system by graphing:




The point of intersection is (5, 195).
So, they both charged \$195 for 5 h of work.

PTS: 1 DIF: 7-8 OBJ: Section 7.4 NAT: RF6 | RF7
TOP: Parallel and Perpendicular Lines KEY: point of intersection | earnings | slope-intercept form | cost

**90.** ANS:
**a)** Let $s$ represent the cost of admission for a senior citizen, let $a$ represent the cost of admission for an adult, and let $c$ represent the cost of admission for a child, all in dollars.
$4s + 2c + 4a = 188$ ①
$2s + 4c + 4a = 180$ ②
$1s + 5c + 1a = 110$ ③

**b)** Solve equation ① for $a$:
Substitute $a =$ into equation ② to get ④:
Substitute $a =$ into equation ③ to get ⑤:
Use elimination or substitution on ④ and ⑤:
$s = 18$
$c = 14$
Substitute $s = 18$ and $c = 14$ into equation ①:
$a = 22$
The admission fees for a senior citizen, an adult, and a child are \$18, \$22, and \$14, respectively.

PTS: 1 DIF: 7-8 OBJ: Section 9.3 NAT: RF9
TOP: Solving Problems Using Systems of Linear Equations
KEY: three variables | scenario | substitution | elimination