

Review for MIDTERM

MIDTERM TASK #1 date _____

MIDTERM TASK #2 date _____



Success Criteria

- Students on IEP – if you will need more time to finish, arrange a ride afterschool on these days (or finish over your lunch that same day – or the next day at the latest)
- You must come to class on the dates above. If you miss any of these days, you must give a doctor's note in order to do the evaluation on another day OR do full exams at the end of the semester!
- Ensure your Survival Guides are complete and corrected. These you may use on PART #1 (but not on PART #2)
- Complete this Review booklet. Check your answers with the back page of the booklet.

Date	pg	Topics	Done?	Corrected?
		Finish and correct your SURVIVAL GUIDES		
	2-4	Linear Relations		
	5-6	Solve Equations		
	7-10	Linear Systems		
	11-13	EXTRA practice		
	14-15	ANSWERS		

FORMULAS GIVEN ON PART #2:

SLOPE	$m = \frac{y_2 - y_1}{x_2 - x_1}$	$m = \frac{\text{rise}}{\text{run}}$
LINEAR EQUATION	$y = mx + b$	

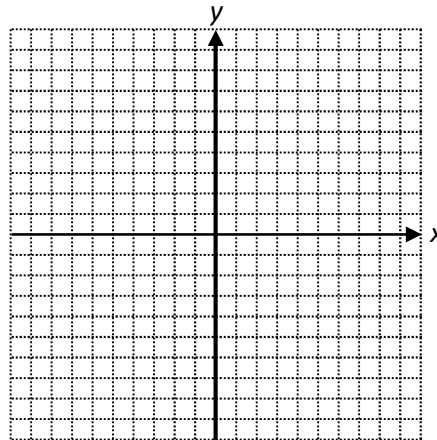
Linear Relations

Things to know:

- Slope
 - as a rate of change
 - between two points
- Graphing
 - table of values
 - Slope y-intercept
 - x-y intercepts
- Determine the equation of a line $y = mx + b$
 - Given m and b
 - Given m or b and a point
 - Parallel and perpendicular
 - More or less steep
- Word Problems

1. Create a table of values for the line $y = 4x - 2$ and graph the results below.

x	$Y = 4x - 2$
-2	
-1	
0	
1	
2	

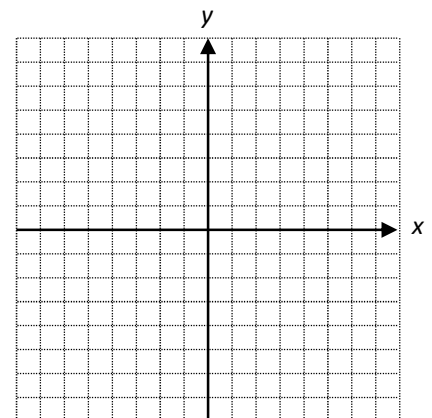
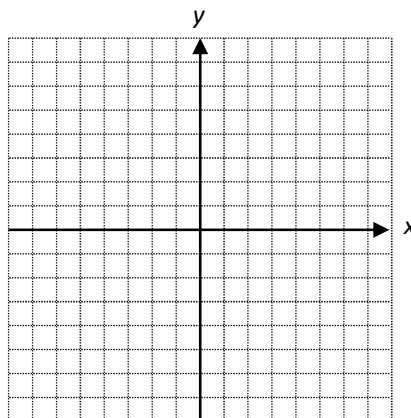
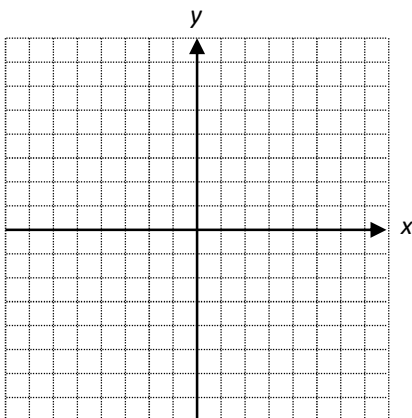


2. Graph the following lines by calculating the x and y intercepts.

a) $y + 8 = -2x$

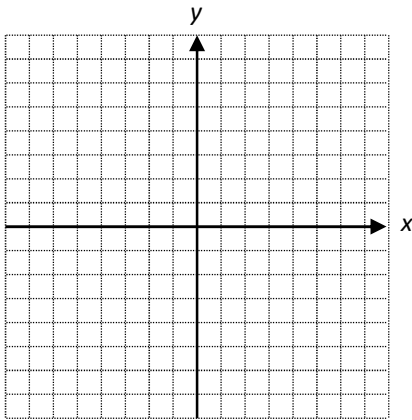
b) $5x - 2y = 10$

c) $-3x - 2y = 12$

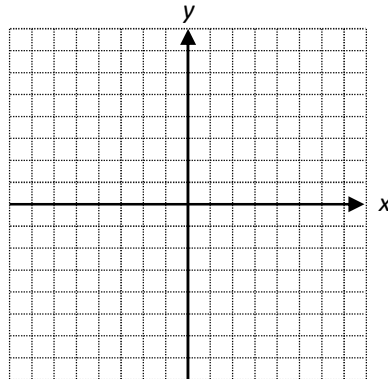


3. Graph the lines using slope y-intercept method.

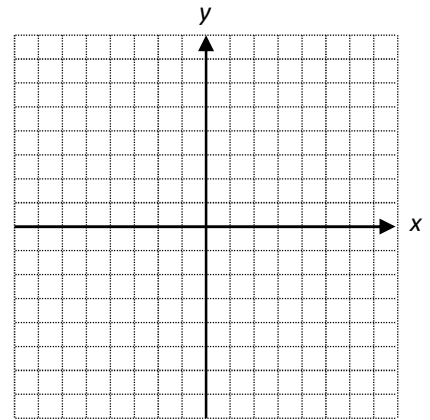
a) $y = -x + 8$



b) $y = \frac{4}{3}x + 1$



c) $y = -2x + 2$



4. Calculate the slope of the line AB. A(3, 4) B(2, -2)

5. Determine the equation of the lines

a) slope is 2 and y intercept is 8

b) $m = -3$ and $b = 2$

c) $b = 0$ and $m = -1/3$

d) slope is 2 and passes through (3, 8)

g) the equation is parallel to $y = -7x + 3$ and $y\text{-int} = 5$

h) the equation is perpendicular to $y = 5x - 9$, $y\text{-int} = 4$

i) the line is perpendicular to $y = -2x + 4$ and $y\text{-int} = -1$

j) the line is steeper than $y = -3x - 1$ and $y\text{-int} = 0$

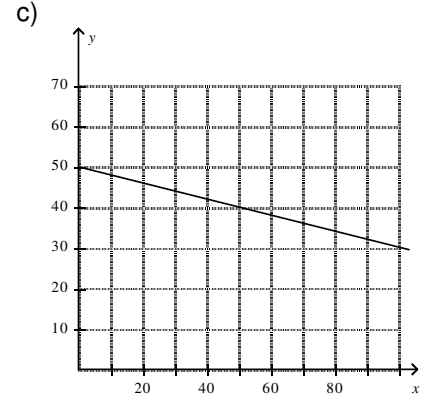
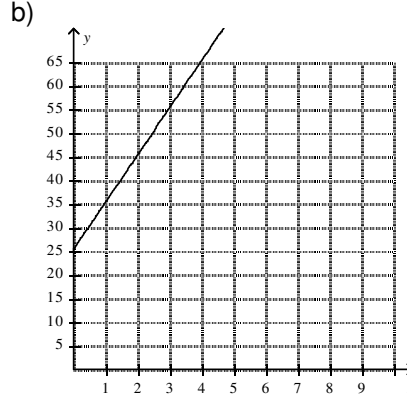
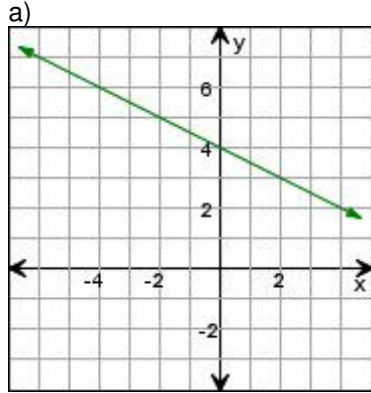
k) passing through through (-3,6) and (9, 0)

e) $y\text{-int}$ is -3 and passes through (2, 5)

f) slope is 2.5 and passes through (0, 0)

l) passing through (1, -1) and (5, 5)

6. Find the equation of the line for each graph.



7. Silvio works in a hair salon. He has 50 regular customers. His customer base is growing at a rate of three new customers per month.

a) Write an equation to describe the total number of customers.

Let _____
Let _____

Equation _____

b) How long will it be before Silvio has 125 customers?

8. Paula bought a parrot. The bird had a 10 word vocabulary, but Paula has taught it 3 new words per week.

a) write an equation to represent the number of words the bird can speak

Let _____
Let _____

Equation _____

b) Determine how large a vocabulary the parrot could have after 1 year (or 52 weeks)

9. The cost of Jack's cell phone is \$150 plus \$30 per month.

a) Write an equation that describes the cost of Jack's cell phone as the months pass.

Let _____
Let _____

Equation: _____

b) How much will Jack spend on the cell phone in 3 years?

10. What is the pattern in the table of values?

x	y
0	-2
1	1
2	4
3	7
4	10
5	13

a) What is the relationship between the rate of change and the slope?

b) What is the slope?

c) What is the y intercept?

d) Write the equation of the line that models this linear system.

Solve Equations

Things to know:

- solve one and two step equations
- rearrange formulas
- use formulas in word problems
- rearrange linear equations with y being isolated

1. Solve each equation:

a) $m+9=-1$

b) $1 = x - \frac{3}{4}$

c) $7y-5=16$

d) $\frac{x-5}{3} = -3$

e) $5x-4=8+2x$

f) $5k-3k=4k-2$

g) $-5(11+x)=-45$

h) $\frac{3}{4}(x+2)=-3$

i) $2(x-10)=5(x-8)$

j) $6(x-2)=3x$

k) $-(w+4)=3(w-4)$

l) $8+3p=2(p+3)$

2. Solve each formula for the indicated variable

a) $A = \frac{bh}{2}$ for h

b) $A = lw$ for l

c) $A = 2\pi r^2 + 2\pi rh$ for h

3. The amount of food energy required by a busy courier is given by the formula $E = -125T + 15250$. E is the amount of food energy in kilojoules. T is the outside temperature in degrees Celsius. Find the outside temperature if the amount of food energy is 12 500 KJ.

4. Alan takes a taxi from his house to his friend Drew's home. The drive is 6 km. The taxi driver charges a flat fee of \$10 plus \$0.25/km. this can be modelled using the equation $C = 0.25x + 10$, where x represents the distance travelled in kilometres, and C represents the cost in dollars. How much will the taxi ride cost?

5. Rearrange the equation the following equations to $y = mx + b$ form.

a) $2x + 3y - 12 = y$

b) $5x - 15y - 15 = 0$

c) $3x - 4y + 12 = 0$

d) $3x - y - 5 = 0$

Linear Systems

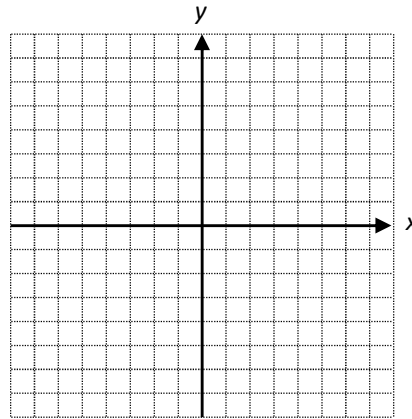
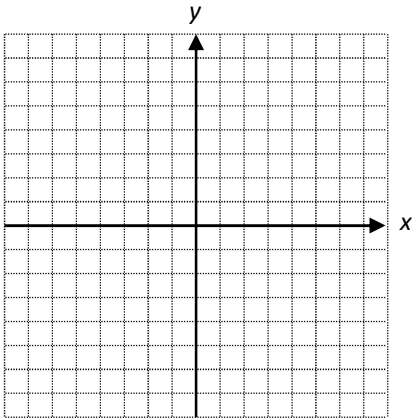
Things to know:

- Solve a linear system by graphing
- Solve a linear system by substitution
- Solve a linear system by elimination
- Model problems for linear systems (ie. come up with equations.)
- Interpret the solution to a system

1. Find the point of intersection by graphing the linear systems given:

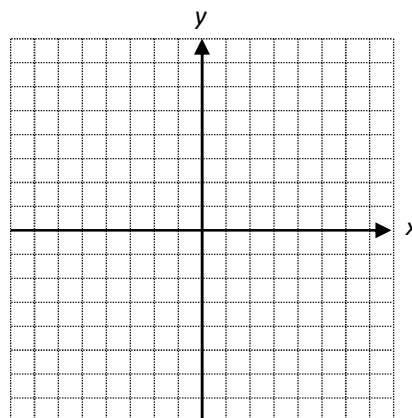
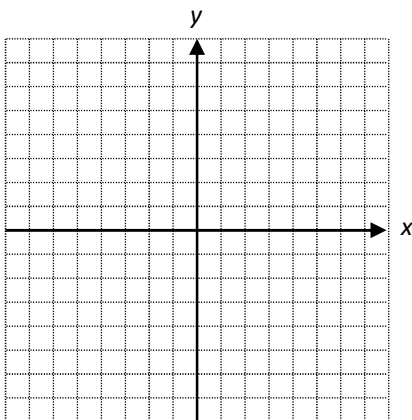
a) $y = 2x + 1$
 $y = 3x - 2$

b) $y = 2x + 1$
 $y = 3x + 5$



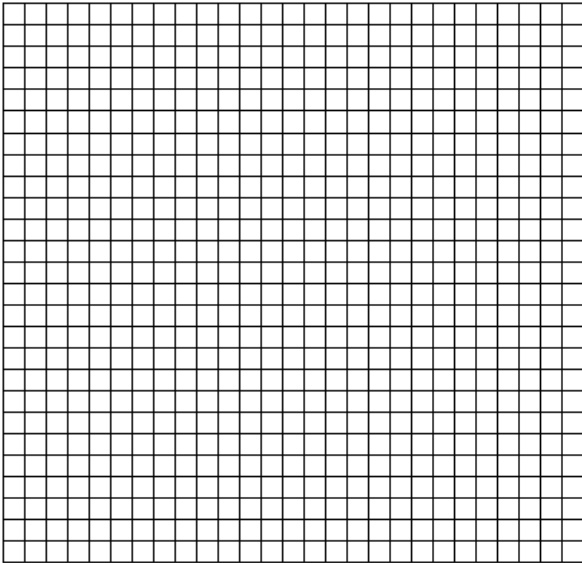
c) $y = x - 1$
 $y = -3x + 3$

d) $y = \frac{-1}{3}x - 3$
 $y = \frac{2}{3}x - 6$



Solve by graphing. Ensure you use appropriate scale, label axes, label lines and give the graph a title. Once POI is found, explain what it means.

2. Alison and Lucy belong to different fitness clubs. Alison has a membership that cost her \$100 and she pays \$3 each time she visits the club. Lucy has a pay-as-you-go membership and she pays \$8 each time she visits her club.
- a) Write a system of linear equations to represent the situation.



b) Fill in the tables to help you graph the lines

Alison's club:

visits	total cost
0	
15	
30	

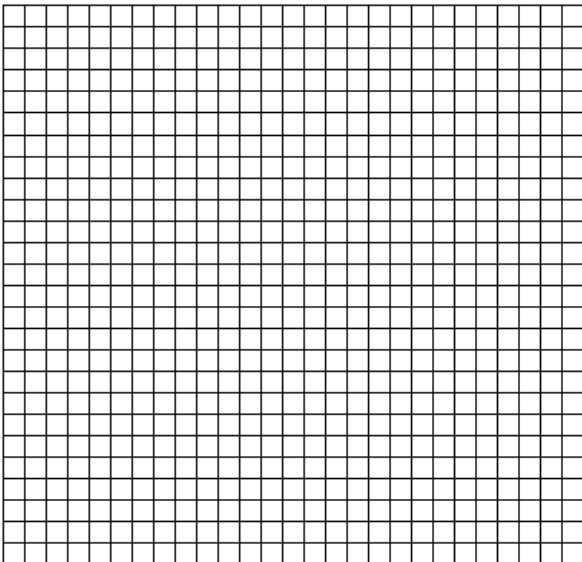
Lucy's club:

visits	total cost
0	
15	
30	

- c) Find and check the point of intersection. What does this point represent?

3. At the bowling alley, Angela rented shoes for \$5 and it cost her \$6.75 to bowl each game. At another bowling alley the cost is \$8 per game

- a) Write a system of linear equations to represent the situation.



b) Fill in the tables to help you graph the lines

First bowling alley:

games	total cost
0	
3	
6	

Second bowling alley:

games	total cost
0	
3	
6	

- c) Find and check the point of intersection. What alley would you choose if you wanted to bowl a lot of games? Why?

4. Solve the following systems by method of substitution.

a) $y = 2x + 1$
 $y = -2x - 1$

b) $y = 3x - 5$
 $2x - 4y = 10$

c) $y = -2x - 6$
 $-x - 3y = 13$

d) $y = -4x - 3$
 $2x - y = 3$

5. Solve the following systems by method of elimination.

a) $3x - 4y = 14$
 $3x + 7y = -8$

b) $x + 2y = 9$
 $4x - 2y = -4$

c) $x + 2y = 2$
 $3x + 5y = 4$

d) $4x - 2y = -2$
 $x + 5y = 5$

EXTRA practice

1. Solve the following

a) $3x - 8 = 7$

b) $\frac{x}{3} + 2 = 6$

c) $6 - 4x = 2x + 12$

d) $2(x+1) = 3x+6$

e) $\frac{2(x+3)}{4} = x-2$

2. Rearrange to $y=mx+b$ form

a) $2x + y - 6 = 0$

b) $9x - 3y + 12 = 0$

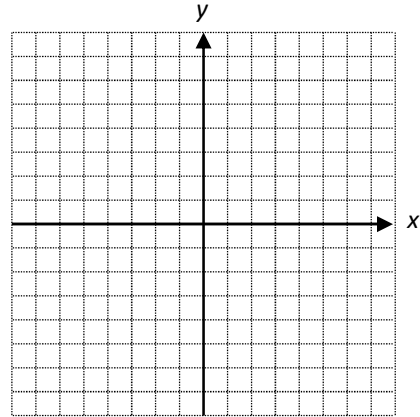
3. Rearrange for the given variable:

a) $P = 2l + 2w$, for w

b) $S = 2\pi rh$, for h

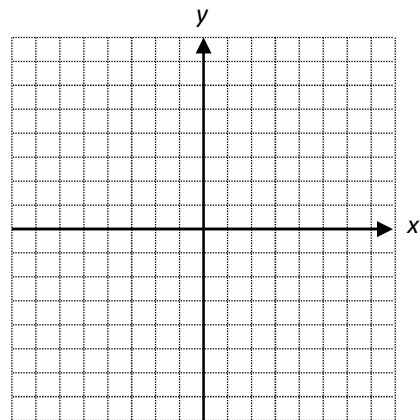
4. Calculate the intercepts for $6x + 4y = 12$.

Graph the line using the intercepts

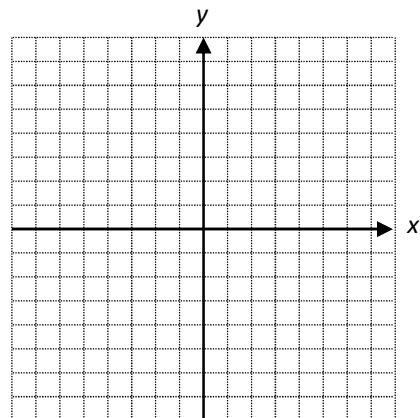


5. Complete the table of values and graph the line.
 $Y = 1.5x + 3$

x	$y = 1.5x + 3$
-2	
-1	
0	
1	
2	
3	



6. Graph using slope y-intercept method $y = -\frac{1}{3}x + 5$



7. Determine the equation of the line for the following.

a) Parallel to $y = -\frac{2}{5}x - 12$

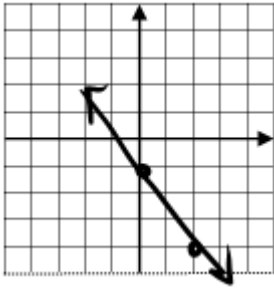
b) perpendicular to $y = -\frac{2}{5}x - 12$

c) has a slope of 4 and passes through (-1, -6)

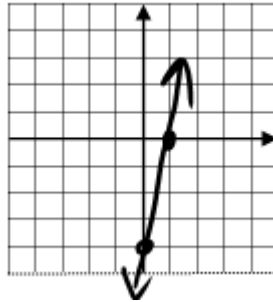
d) passes through the points (3, 4) and (1, -6)

8. Use the graph to find the equation of the line

a)



b)



9. Model the following situations. Include 2 "let" statements and 2 equations.

a) KC Fitness Club charges a flat fee of \$25 a month plus \$5 per visit. Workout Zone charges a flat fee of \$35 a month plus \$3 per visit.

b) For Nina's retirement party, her family decides to rent a hall for a dinner. Regal Hall costs \$500 for the hall rental and \$15 per guest, and Party Place charges \$410 for the hall and \$18 per guest.

c) George wants to hire a truck to do some moving. Athena's Garage charges \$80 for the day plus \$0.22/km. City Truck Rental charges \$100 for the day and \$0.12/km.

d) Neil's brother has a total of 8 cars and trucks to play with. For his birthday, he wants to double the number of cars he has. If he does he will then have a total of 11 cars and trucks. How many cars and trucks does Neil's brother have now?

e) Christine plans to go to college in a year and needs to save for tuition. She invests her summer earnings of \$3050, part at 8% interest per year, and part at 7.5% per year. After one year, Christine has earned a total of \$234 in interest.

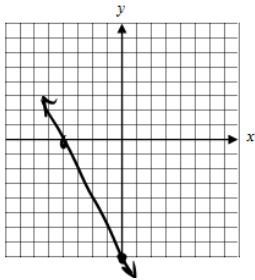
f) Students hold a car wash to raise money for a school trip to the west coast. They charge \$7 per car and \$10 per van. They washed a total of 52 cars and vans and earned \$457.

Answers to Linear Equations

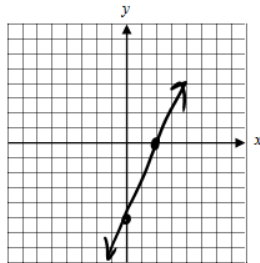
1.

x	Y = 4x - 2
-2	-10
-1	-6
0	-2
1	2
2	6

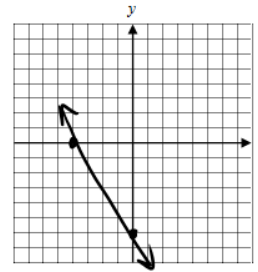
2. a) x int (-4,0) , y int (0, -8)



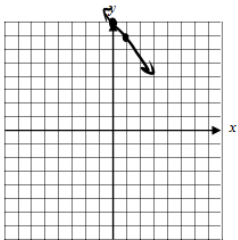
b) x int (2,0) , y int (0, -5)



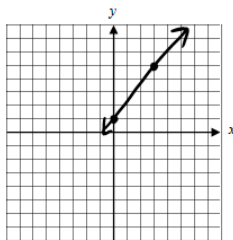
c) x int (-4,0) , y int (0, -6)



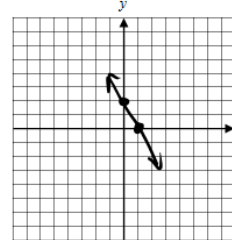
3. a)



b)



c)



4. m=6

5. a) $y=2x+8$ b) $y=-3x+2$ c) $y=-1/3x$ d) $y=2x+2$ e) $y=4x-3$
 f) $y=2.5x$ g) $y=-7x+5$ h) $y=-1/5x+4$ i) $y=1/2 x-1$
 j) (pick any number bigger than 3) $y=4x$ k) $y=-0.5x+4.5$ l) $y=1.5x-2.5$

6.a) $y=-1/2x+4$

b) $y=10x+25$

c) $y=-0.2x+50$

7.

a) x represent month
 y represent customers
 $y=50+3x$

b) 25 months

8.

a) x represent weeks
 y represent vocabulary
 $y=10+3x$

b) 166 words

9.

a) x represent month
 y represent cost
 $y=150+30x$

b) \$1230

10.

x	y
0	-2
1	1
2	4
3	7
4	10
5	13

- a) rate of change = slope $\frac{\Delta y}{\Delta x} = \frac{3}{1}$
 b) slope = 3
 c) y-int = -2
 d) $y=3x-2$

Answers to Solve Equations

1. a) $m = -10$ b) $x = 1.75$ c) $y = 3$ d) $x = -4$ e) $x = 4$ f) $k = 1$
 g) $x = -2$ h) $x = -6$ i) $x = 20/3$ or 6.7 j) $x = 4$ k) $w = 2$ l) $p = -2$
2. a) $h = \frac{2A}{b}$ b) $l = \frac{A}{w}$ c) $h = \frac{A - 2\pi r^2}{2\pi r}$
3. $T = 22^\circ C$ 4. \$11.50
5. a) $y = -1x + 6$ b) $y = 1/3x - 1$ c) $y = 3/4x + 3$ d) $y = 3x - 5$

Answers to Linear Systems

1. a) (3,7) b) (-4, -7) c) ((1,0) d) (3, -4)
- 2.a) $C = 100 + 3v$ $C = 8v$ POI (20, 160) it represents that for 20 visits cost of both clubs is the same at \$160
- 3.a) $C = 5 + 6.75g$ $C = 8g$ POI (4, 32) If you bowl a lot, choose the 1st bowling alley since its lower cost per game
- 4.a) (-0.5, 0) b) (1, -2) c) (-1, -4) d) (0, -3)
- 5.a) (2, -2) b) (1, 4) c) (-2, 2) d) (0, 1)

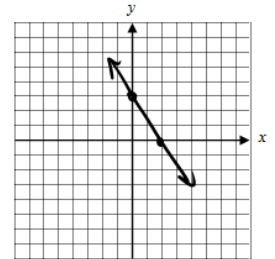
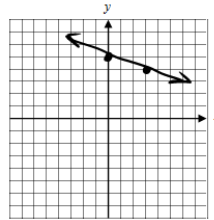
Answers to EXTRA practice

- 1.a) $x = 5$ b) $x = 12$ c) $x = -1$ d) $x = -4$ e) $x = 7$ 2. a) $y = -2x + 6$ b) $y = 3x + 4$
3. a) $w = \frac{P - 2l}{2}$ b) $h = \frac{S}{2\pi r}$ 4. x intercept (2,0) , y intercept (0, 3)

5.

x	$y = 1.5x + 3$
-2	0
-1	1.5
0	3
1	4.5
2	6
3	7.5

6.



7. a) $y = -\frac{2}{5}x + \#$ b) $y = \frac{5}{2}x + \#$ c) $y = 4x - 2$ d) $y = 5x - 11$ 8. a) $y = -\frac{3}{2}x - 1$ b) $y = 4x - 4$

9.a) Let x represent the number of visits.

Let y represent the total cost.

$$y = 5x + 25$$

$$y = 3x + 35$$

b) Let x represent the number of guests.

Let y represent the total cost.

$$y = 15x + 500$$

$$y = 18x + 410$$

c) Let x represent number of kilometres.

Let y represent the total cost of renting the truck.

$$y = 0.22x + 80$$

$$y = 0.12x + 100$$

d) Let x represent number of cars.

Let y represent number of trucks.

$$x + y = 8$$

$$2x + y = 11$$

e) Let x represent the amount invested at 8%.

Let y represent the amount invested at 7.5%

$$x + y = 3050$$

$$0.08x + 0.075y = 234$$

f) Let x represent number of cars.

Let y represent number of vans.

$$x + y = 52$$

$$7x + 10y = 457$$