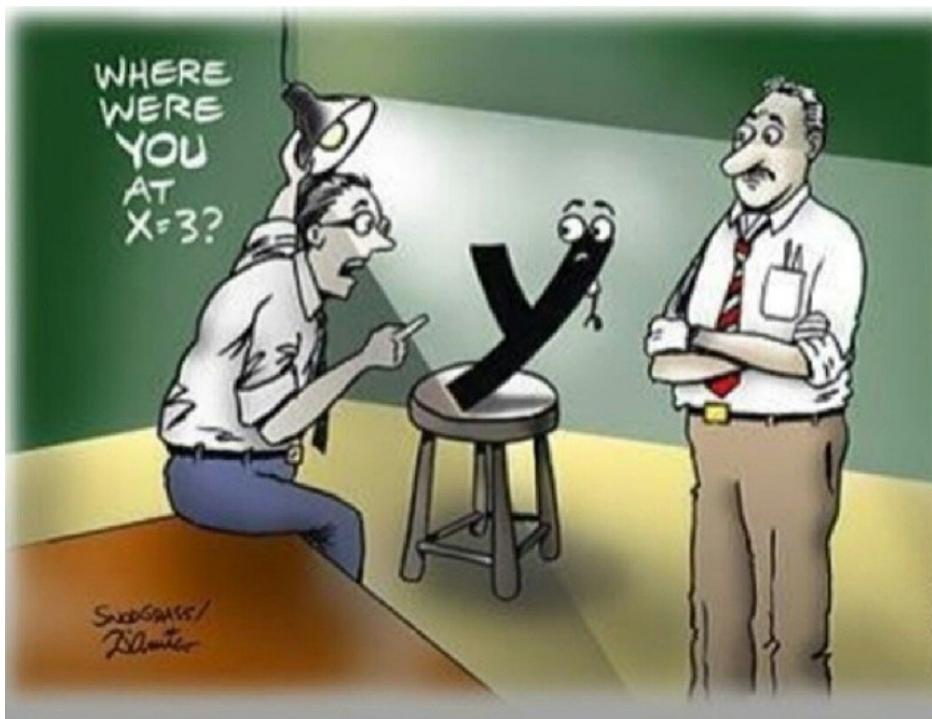


MATH 9

FINAL EXAM REVIEW BOOK 3



UNIT 5 - LINEAR RELATIONS

UNIT 6 - SOLVING LINEAR EQUATIONS

UNIT 7 - FINANCE

NAME: _____

BLOCK: _____

Study Checklist

This review booklet is by no means a "practice final". It is a collection of practice questions on each unit, meant to guide your final exam studying and prepare you for the types of questions you are likely to see. DO NOT treat this booklet as a practice test. If you're stuck on a question, look it up and ask for help! DO NOT go straight to the answer key when you come across a question you cannot remember how to do. Difficult questions SHOULD guide your study! Always look up a concept in your class notes if you are stuck, then attempt the question again.

BEFORE beginning this booklet you should:

- read through your class notes booklet on each topic
 - make your own "quick summary page" of important formulas & key concepts for the unit
 - review quizzes & tests from the unit to recall strengths & weaknesses (*a great study method would be to re-do old quizzes & tests on a separate piece of paper*)

WHILE working through this booklet you should:

- look up concepts & example problems in your class notes when you come across a problem you are stuck on
 - make a list of "questions to ask my teacher" so you can come to class and use your time efficiently.

Questions I'm having difficulty with:

Unit 5: Linear Relations

my notes and things to remember...

Unit 5: Linear Relations

1. Determine the common difference in the linear pattern.

a) $-7, -4, -1, \dots$

b) $-1, -4, -7, \dots$

c) $2\frac{1}{2}, 2\frac{3}{4}, 3, \dots$

d) $6.5, 5.3, 4.1, \dots$

2. Determine the 100th term of the linear pattern.

a) $12, 9, 6, 3, \dots$

b) $-7, -3, 1, 5, \dots$

3. Determine a general equation of the n th term in linear pattern.

a) $12, 9, 6, 3, \dots$

b) $-7, -3, 1, 5, \dots$

4. The cost of printing a math workbook is a setup cost plus a cost for each book printed. If 1000 books printed cost \$14 300, and 5000 books printed cost \$64 300, what is the setup cost for printing the math workbooks?

5. The value of a new computer network for an office is \$12 000. If the depreciation of the computers, with respect to time, in dollars per year is 15%, in how many years will the computer network have no value?

6. Determine the missing ordered pair values for the given equations.

a) $y = \frac{2}{3}x - 4$

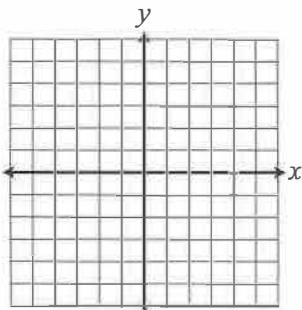
x	y
0	
	0
-3	

b) $y = -\frac{4}{3}x + 2$

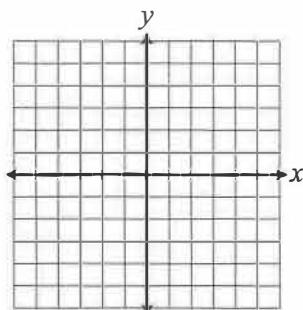
x	y
0	
	0
	6

7. Graph the equation and identify the y -intercept

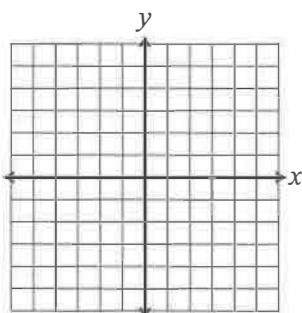
a) $y = -\frac{3}{4}x + 2$



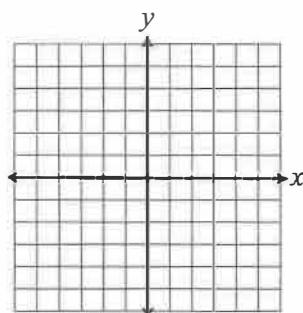
b) $y = \frac{5}{3}x - 1$



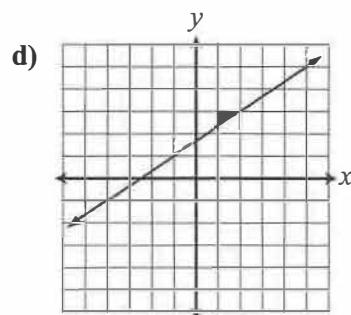
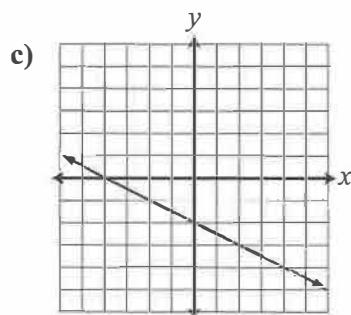
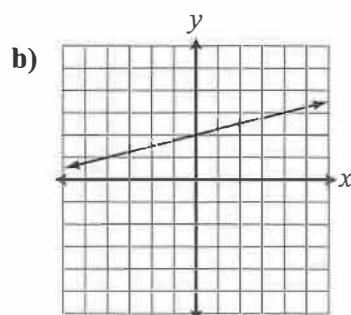
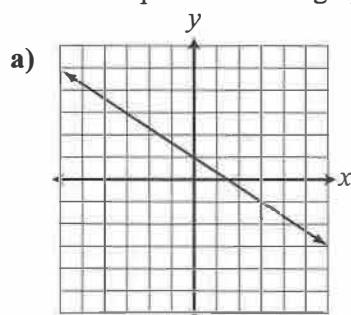
c) $y = -\frac{5}{2}x + 1$



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



8. Write an equation for the graph.

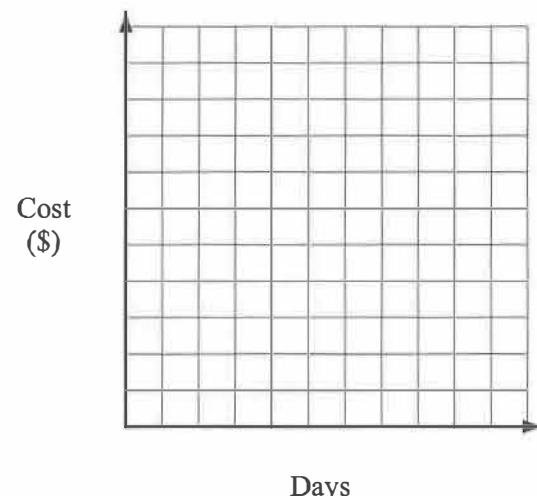


9. The cost, C , in dollars for renting a riding lawn mower is $C = 65 + 40d$, where d is the number of days renting.

a) Graph this equation from 1 to 20 days.

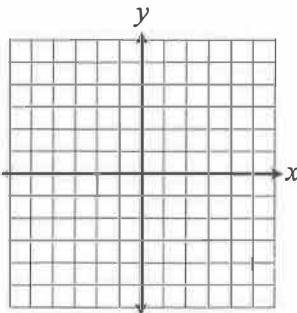
b) Find the cost of renting the lawn mower for 16 days.

c) If the lawn mower is worth \$2265, in how many days would the rental charge equal the value of the lawn mower?

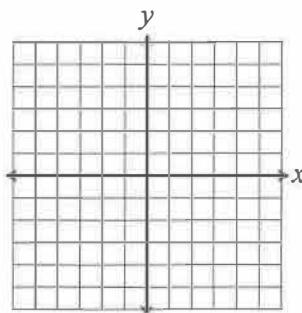


10. Graph the equations.

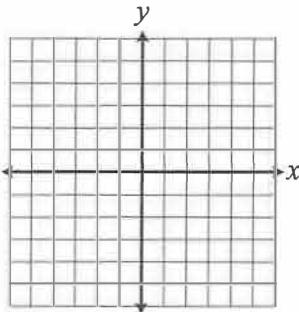
a) $2x + \frac{2}{3}y = 2$



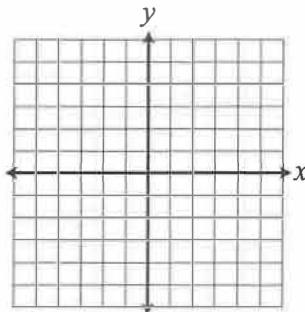
b) $\frac{1}{3}x - 0.2y = 1$



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



d) $0.25x + \frac{1}{5}y = -1$



11. Match each equation with its graph.

a) $y = -x + 2$ _____

b) $y = \frac{1}{2}x$ _____

c) $y = 2$ _____

d) $x = -3$ _____

e) $y = -2x$ _____

f) $3x - 2y = 6$ _____

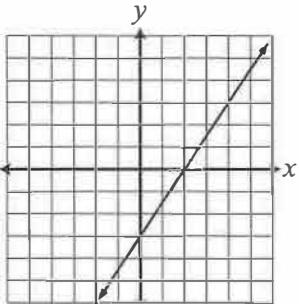
g) $2x + 3y = 6$ _____

h) $x - 2y = 6$ _____

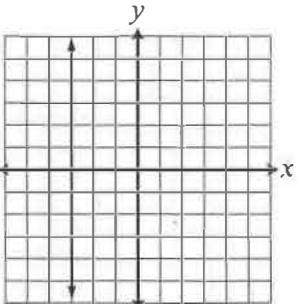
i) $3x + 2y = -6$ _____

j) $2x + 3y = -6$ _____

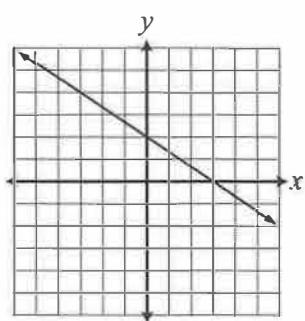
i)



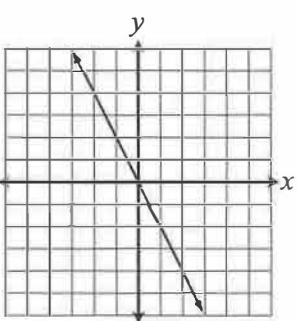
ii)



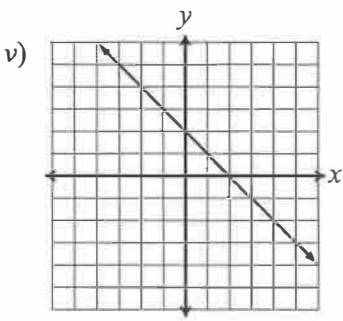
iii)



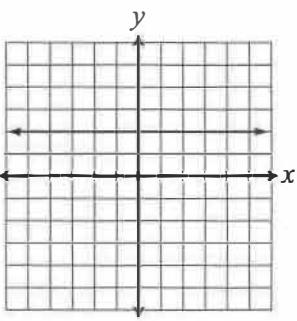
iv)



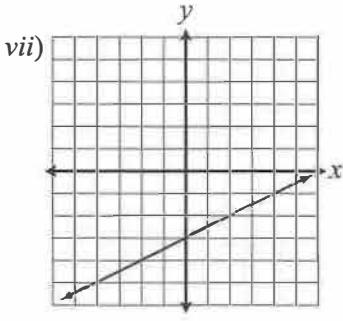
v)



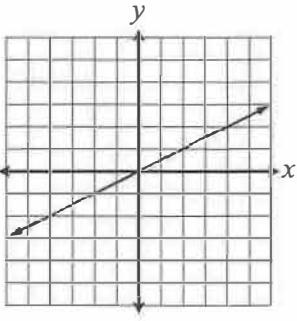
vi)



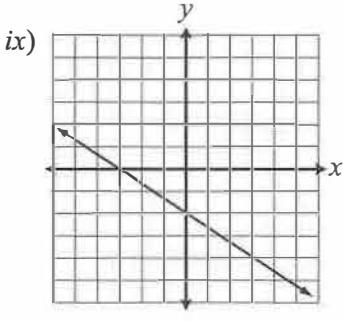
vii)



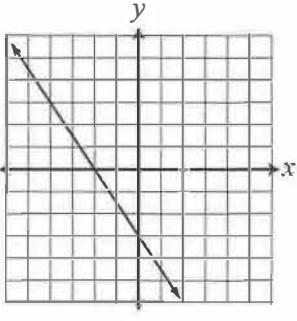
viii)



ix)



x)



Unit 6: Solving Linear Equations

my notes and things to remember...

Unit 6: Solving Linear Equations

1. Determine the solution of each equation.

a) $4x - 2 = 3x + 3$ _____ b) $-4x - 2 = -3x + 3$ _____

c) $\frac{2}{3}x + 4 = -6$ _____ d) $-\frac{2}{3}x - 4 - 6 = 0$ _____

e) $\frac{3x}{4} = 12$ _____ f) $\frac{4}{3x} = -12$ _____

g) $-2x + 3 = 3x + 13$ _____ h) $-2x - 3 = x - 3$ _____

i) $\frac{2}{3}x - 5 = \frac{1}{2}x - 3$ _____ j) $\frac{2}{3}x + 2 = -\frac{1}{2}x - 8$ _____

2. Write an algebra equation, then determine a solution.

- a) Determine the three consecutive even integers that total to 132.
b) The perimeter of an isosceles triangle is 62 cm. The equal sides are four less than twice the base. Determine the length of each side of the triangle.

3. Solve.

a) $\frac{x}{3} - \frac{x}{4} = -2$ _____ b) $-\frac{7x}{12} - \frac{2}{3} = \frac{1}{2}$ _____

c) $\frac{3}{4}(x + 1) = \frac{1}{2}(x - 3)$ _____ d) $\frac{1}{2}(2x + 1) - \frac{2}{3}(x - 2) = \frac{1}{6}$ _____

e) $\frac{1}{5}(3 - x) + \frac{1}{2}(2x + 1) = \frac{3}{10}$ _____ f) $0.3x + 6.9 = -2x$ _____

g) $2.4x = -0.04x - 2.44$ _____ h) $1.5(5x + 2) = 3$ _____

i) $0.2(x - 1.5) = 0.25x$ _____ j) $1.2(x + 7.5) = 2.5x - 17$ _____

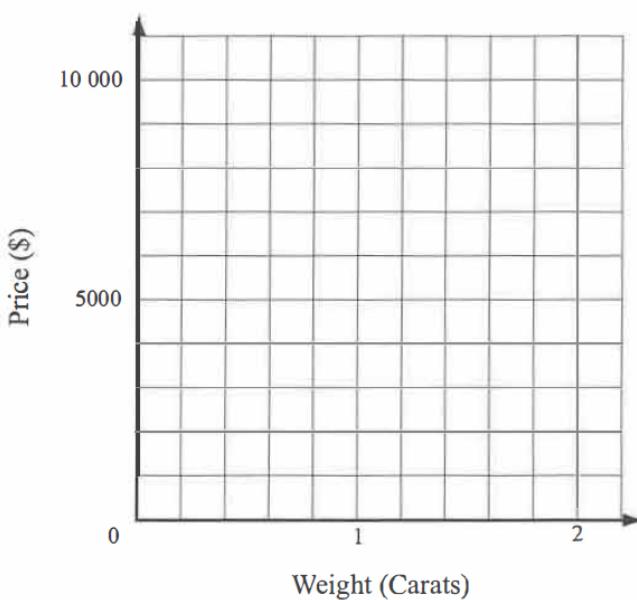
8. Prices for emerald-cut diamonds are given by the table below. Graph the data in the table below.

Weight (Carats)	Price
0.5	\$1600
0.7	\$2800
1.0	\$4600

- a) What should be the price for a 0.8 carat diamond?
b) What size diamond could you buy for \$9200?
c) Which answers are examples of:

Interpolation? _____ .

Extrapolation? _____ .



9. The Body Mass Index (BMI) is used to indicate human body fat based on an individual's weight and height.

The formula for calculating BMI is $\frac{\text{weight in kilograms}}{(\text{height in metres})^2}$

BMI Range	Category
less than 18.5	underweight
18.5 to 25	normal
25 to 30	overweight
over 30	obese

- a) If a man is 1.88 metres tall, find the range of weight for him to be in each of the four BMI categories.

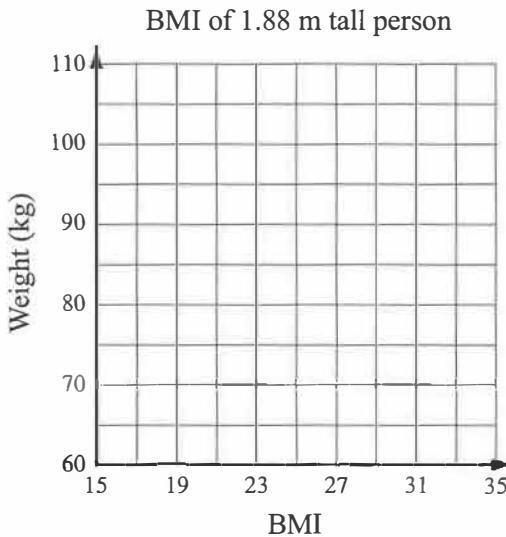
i) underweight

ii) normal

iii) overweight

iv) obese

- b) Graph the values for being underweight, normal, overweight, and obese.



- c) Using the graph, what is the BMI of the person if he weighs 95 kilograms?

- d) Using the graph, what is the BMI of the person if he weighs 110 kilograms?

- e) Using the graph, which answer is an example of extrapolation?

- f) Using the graph, which answer is an example of interpolation?

Extra Word Problems Practice: 1 Step Equations

- 1) Lisa is cooking muffins. The recipe calls for 7 cups of sugar. She has already put in 2 cups. How many more cups does she need to put in?
- 2) At a restaurant, Mike and his three friends decided to divide the bill evenly. If each person paid \$13 then what was the total bill?
- 3) How many packages of diapers can you buy with \$40 if one package costs \$8?
- 4) Last Friday Trevon had \$29. Over the weekend he received some money for cleaning the attic. He now has \$41. How much money did he receive?
- 5) Last week Julia ran 30 miles more than Pranav. Julia ran 47 miles. How many miles did Pranav run?
- 6) How many boxes of envelopes can you buy with \$12 if one box costs \$3?
- 7) Amanda and her best friend found some money buried in a field. They split the money evenly, each getting \$24.28. How much money did they find?
- 8) Jenny wants to buy an MP3 player that costs \$30.98. How much change does she receive if she gives the cashier \$40?

Extra Word Problems Practice: 2 Step Equations

- 1) 331 students went on a field trip. Six buses were filled and 7 students traveled in cars. How many students were in each bus?
- 2) Aliyah had \$24 to spend on seven pencils. After buying them she had \$10. How much did each pencil cost?
- 3) The sum of three consecutive numbers is 72. What are the smallest of these numbers?
- 4) The sum of three consecutive even numbers is 48. What are the smallest of these numbers?
- 5) You bought a magazine for \$5 and four erasers. You spent a total of \$25. How much did each eraser cost?
- 6) Maria bought seven boxes. A week later half of all her boxes were destroyed in a fire. There are now only 22 boxes left. With how many did she start?
- 7) Sumalee won 40 super bouncy balls playing horseshoes at her school's game night. Later, she gave two to each of her friends. She only has 8 remaining. How many friends does she have?
- 8) Imani spent half of her weekly allowance playing mini-golf. To earn more money her parents let her wash the car for \$4. What is her weekly allowance if she ended with \$12?

Unit 7: Finance

my notes and things to remember...

Unit 7: Finance

1. Jennifer works as a welder for a local fabrication company. Her regular work week is 40 hours with an hourly pay of \$22.80 plus time and a half for overtime. If Jennifer worked 42.5 hours last week, what is her gross pay?
 2. Some Cowichan sweaters are sold independently by their knitters. If Namu takes 28 hours to knit a sweater and sells it for \$425, how much is she making per hour if the wool costs \$35?
 3. Liang works at a new car dealership. He receives a commission of 1.5% on the first \$200 000 of sales and 2.5% on everything over \$200 000. If Liang has sales of \$380 000 for the month, what is his commission?
 4. Li Ming receives a monthly salary of \$2460 paid semi-monthly. Her regular workweek is 37.5 hours plus time and a half for overtime. If Li Ming works 5 hours of overtime in this semi-monthly pay period, what is her gross pay for the pay period?
5. Compute the amount of simple interest.
- a) \$1260 at 18% for 1.25 years.
 - b) \$1470 at 7% for 312 days
6. Solve using simple interest.
- a) How many days does it take for \$7000 at 11% interest to reach \$7200?
 - b) At what rate of interest will \$2000 earn \$246 in 1.5 years?
 - c) Find the future value on an investment of \$1120 earning 6% interest for 16 months.
 - d) What payment is required to pay off a loan of \$750 at 25% interest 2 years and 5 months later?

UNIT 5 LINEAR EQUATIONS ANSWER KEY

1. a) 3 b) -3 c) $\frac{1}{4}$ d) -1.2

2. a) -285 b) 389

3. a) $t = 15 - 3n$ b) $t = 4n - 11$

4. \$1800

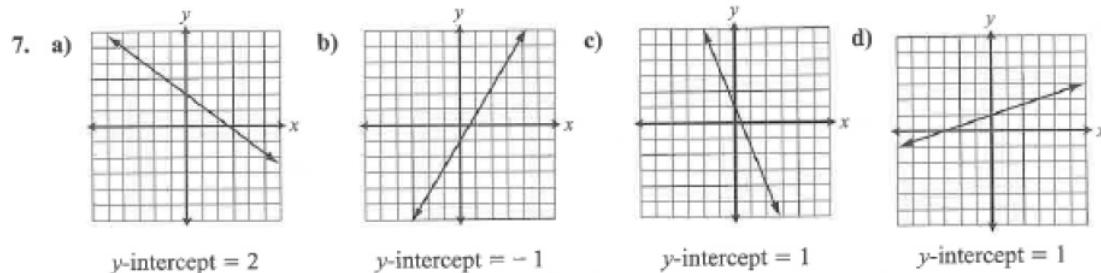
5. $V = -0.15(12\,000x) + 17\,000 = 0 \rightarrow x = 6 \text{ years, 8 months}$

6. a)

x	y
0	-4
6	0
-3	-6

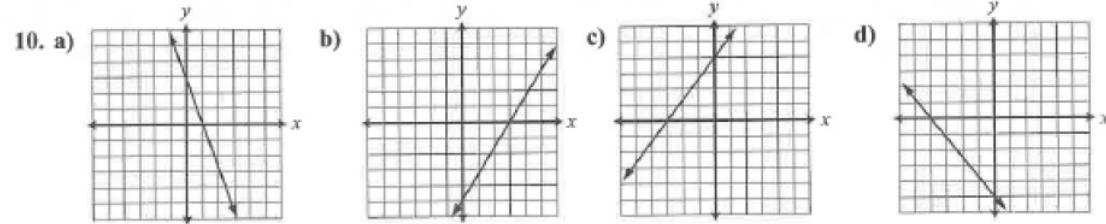
b)

x	y
0	2
$\frac{3}{2}$	0
-3	6



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

9. b) \$705 c) 55 days



11. a) v b) viii c) vi d) ii e) iv f) i g) iii h) vii i) x j) ix

UNIT 6 SOLVING LINEAR EQUATIONS ANSWER KEY

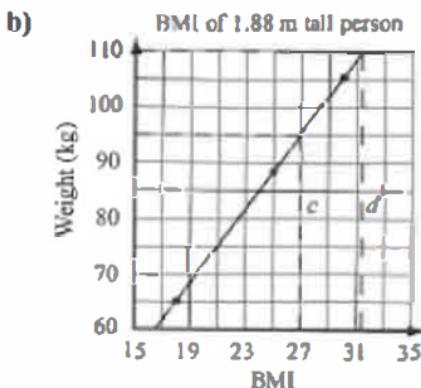
1. a) 5 b) -5 c) -15 d) -15 e) 16 f) $-\frac{1}{9}$ g) -2 h) 0 i) 12 j) $-\frac{60}{7}$

2. a) Let $x = \text{smallest integer}$, then $x + (x - 2) + (x + 4) = 132 \rightarrow 3x + 6 = 132 \rightarrow 3x = 126 \rightarrow x = 42$;
numbers are: 42, 44, 46

b) Let $x = \text{base}$, then $x + (2x - 4) + (2x - 4) = 62 \rightarrow 5x - 8 = 62 \rightarrow 5x = 70 \rightarrow x = 14$;
base is 14 cm, therefore sides are $2(14) - 4 = 24$ cm; sides are 14 cm, 24 cm, 24 cm

3. a) -24 b) -2 c) -9 d) -5 e) -1 f) -3 g) -1 h) 0 i) -6 j) 20

8. a) \$3500 b) 1.8 carat c) Interpolation: a Extrapolation: b
9. a) i) less than 65.4 kg ii) between 65.4 and 88.4 kg iii) between 88.4 and 106 kg iv) above 106 kg



- c) ~ 27 d) ~ 31 e) 9d f) 9c

UNIT 7 FINANCE ANSWER KEY

- Gross pay = $22.80(40) + 22.80(2.5)(1.5) = \997.50
- Profit = $425 - 35 = \$390$; Per hour = $\frac{390}{28} = \$13.93$
- Commission = $0.015(200\,000) + 0.025(180\,000) = \7500
- To calculate overtime pay, first calculate her regular hourly pay rate.
 $\text{Yearly pay} = 2460 \cdot 12 = \$29\,520$; $\text{Weekly pay} = \frac{29\,520}{52} = \569.69 ; $\text{Hourly pay} = \frac{569.69}{37.5} = \15.14
 $\text{Pay} = \frac{2460}{2} + 15.14(5 \times 1.5) = 1230 + 113.55 = \1343.55
- a) $I = P \cdot r \cdot t = 1260(0.18)(1.25) = \283.50 b) $I = P \cdot r \cdot t = 1470(0.07)\left(\frac{312}{365}\right) = \87.96
- a) $I = P \cdot r \cdot t \rightarrow 7200 - 7000 = 7000(0.11)\frac{t}{365} \rightarrow t = \frac{200 \times 365}{7000 \times 0.11} = 948 \rightarrow 95 \text{ days}$
b) $I = P \cdot r \cdot t \rightarrow 246 = 2000 \cdot r \cdot 1.5 \rightarrow r = \frac{246}{3000} = 0.082 \text{ or } 8.2\%$
- c) $I = P \cdot r \cdot t = 1120(0.06)\left(\frac{16}{12}\right) = \89.60 ; $F = P + I = 1120 + 89.60 = \1209.60
d) $I = P \cdot r \cdot t = 750(0.25)\left(\frac{29}{12}\right) = \453.13 ; $F = P + I = 750 + 453.13 = \1203.13

Extra Word Problems Practice: 1 Step Equations ANSWER KEY

4 pp!

- 1) Lisa is cooking muffins. The recipe calls for 7 cups of sugar. She has already put in 2 cups. How many more cups does she need to put in?

5

$$\begin{array}{r} \cancel{-2} + x = 7 \\ -2 \end{array}$$

$x = 5$

- 3) How many packages of diapers can you buy with \$40 if one package costs \$8?

5

$$\begin{array}{r} \cancel{8} \cdot (8) = 40 \\ -8 \\ \hline x = 5 \end{array}$$

- 5) Last week Julia ran 30 miles more than Pranav. Julia ran 47 miles. How many miles did Pranav run?

17

$$\begin{array}{r} \cancel{x} + 30 = 47 \\ -30 \end{array}$$

$x = 17$

- 7) Amanda and her best friend found some **money buried in a field**. They split the money evenly, each getting \$24.28. How much money did they find?

\$48.56

$$\begin{array}{r} \cancel{\times 2} \cancel{x} = 24.28 \times 2 \\ \cancel{2} \end{array}$$

$x = 48.56$

- 2) At a restaurant, **Mike and his three friends** decided to divide the bill evenly. If each person paid \$13 then what was **the total bill**?

\$52

$$\begin{array}{r} \cancel{\times 4} \cancel{x} = 13 \times 4 \\ \cancel{4} \\ \hline x = 52 \end{array}$$

- 4) Last Friday Trevon had \$29. Over the weekend he received some money for cleaning the attic. He now has \$41. How much money did he receive?

\$12

$$\begin{array}{r} \cancel{29} + x = 41 \\ -29 \\ \hline x = 12 \end{array}$$

- 6) How many boxes of envelopes can you buy with \$12 if one box costs \$3?

4

$$\begin{array}{r} \cancel{x} \cdot (3) = 12 \\ \cancel{3} \\ \hline x = 4 \end{array}$$

- 8) Jenny wants to buy an MP3 player that costs \$30.98. How much change does she receive if she gives the cashier \$40?

\$9.02

$$\begin{array}{r} 40 - 30.98 = x \\ \hline x = 9.02 \end{array}$$

sweet!

→ app!

Extra Word Problems Practice: 2 Step Equations ANSWER KEY

- 1) 331 students went on a field trip. Six buses were filled and 7 students traveled in cars. How many students were in each bus?

54
$$\begin{array}{r} 6x + 7 = 331 \\ -7 \quad -7 \\ \hline 6x = 324 \\ \cancel{6} \quad \cancel{6} \\ \hline x = 54 \end{array}$$

Like 1, 2, 3

- 3) The sum of three consecutive numbers is 72. What are the smallest of these numbers?

23 $x = \text{smallest } \#$

$$\begin{array}{r} x + (x+1) + (x+2) = 72 \\ \cancel{x} \quad \cancel{x+1} \quad \cancel{x+2} \\ \hline 3x + 3 = 72 \\ -3 \quad -3 \\ \hline 3x = 69 \\ \cancel{3} \quad \cancel{3} \\ \hline x = 23 \end{array}$$

- 5) You bought a magazine for \$5 and four erasers. You spent a total of \$25. How much did each eraser cost?

\$5
$$\begin{array}{r} 5 + 4x = 25 \\ -5 \quad -5 \\ \hline 4x = 20 \\ \cancel{4} \quad \cancel{4} \\ \hline x = 5 \end{array}$$

- 7) Sumalee won 40 super bouncy balls playing horseshoes at her school's game night. Later, she gave two to each of her friends. $2x$ She only has 8 remaining. How many friends does she have?

16
$$\begin{array}{r} 40 - 2x = 8 \\ -40 \quad -40 \\ \hline -2x = -32 \\ \cancel{-2} \quad \cancel{-2} \\ \hline x = 16 \end{array}$$

- 2) Aliyah had \$24 to spend on seven pencils. After buying them she had \$10. How much did each pencil cost?

\$2
$$\begin{array}{r} 24 - 7x = 10 \\ -24 \quad -24 \\ \hline -7x = -14 \\ \cancel{-7} \quad \cancel{-7} \\ \hline x = 2 \end{array}$$

- 4) The sum of three consecutive even numbers is 48. What are the smallest of these numbers? $\hookrightarrow 2, 4, 6$
 $x, (x+2), (x+4)$

14
$$\begin{array}{r} x + (x+2) + (x+4) = 48 \\ \cancel{x} \quad \cancel{x+2} \quad \cancel{x+4} \\ \hline 3x + 6 = 48 \\ -6 \quad -6 \\ \hline 3x = 42 \\ \cancel{3} \quad \cancel{3} \\ \hline x = 14 \end{array}$$

- 6) Maria bought seven boxes. A week later half of all her boxes were destroyed in a fire. There are now only 22 boxes left. With how many did she start?

37
$$\begin{array}{r} \times 2 \quad \frac{x+7}{2} = 22 \quad \times 2 \\ \cancel{x+7} \quad \cancel{x+7} \\ \hline -7 \quad -7 \\ \hline x = 37 \end{array}$$

- 8) Imani spent half of her weekly allowance playing mini-golf. To earn more money her parents let her wash the car for \$4. What is her weekly allowance if she ended with \$12?

\$16
$$\begin{array}{r} \frac{x}{2} + 4 = 12 \\ -4 \quad -4 \\ \hline \frac{x}{2} = 8 \quad \times 2 \\ \cancel{\frac{x}{2}} \quad \cancel{\frac{x}{2}} \\ \hline x = 16 \end{array}$$