

First Name: \_\_\_\_\_

Last Name: \_\_\_\_\_

**54&55 – Worksheet – Chapter 6-9 Review**

**140 marks**

**Part 1:** Graphing – Chapter 6      \_\_\_/8 marks

**Part 2:** Graphing – Chapter 7      \_\_\_/6 marks

**Part 3:** Graphing – Chapter 8&9      \_\_\_/6 marks

**Part 4:** Algebra – Chapter 6      \_\_\_/5 marks

**Part 5:** Algebra – Chapter 7      \_\_\_/8 marks

**Part 6:** Algebra – Chapter 8&9      \_\_\_/7 marks

*(Checklist)* What areas do I need to study?

**Chapter 6**

- Linear and Non-Linear
- Relations and Functions
- Domain and Range
- Slope

**Chapter 7**

- Slope y-Intercept
- Slope-Point
- General Form
- Converting Forms

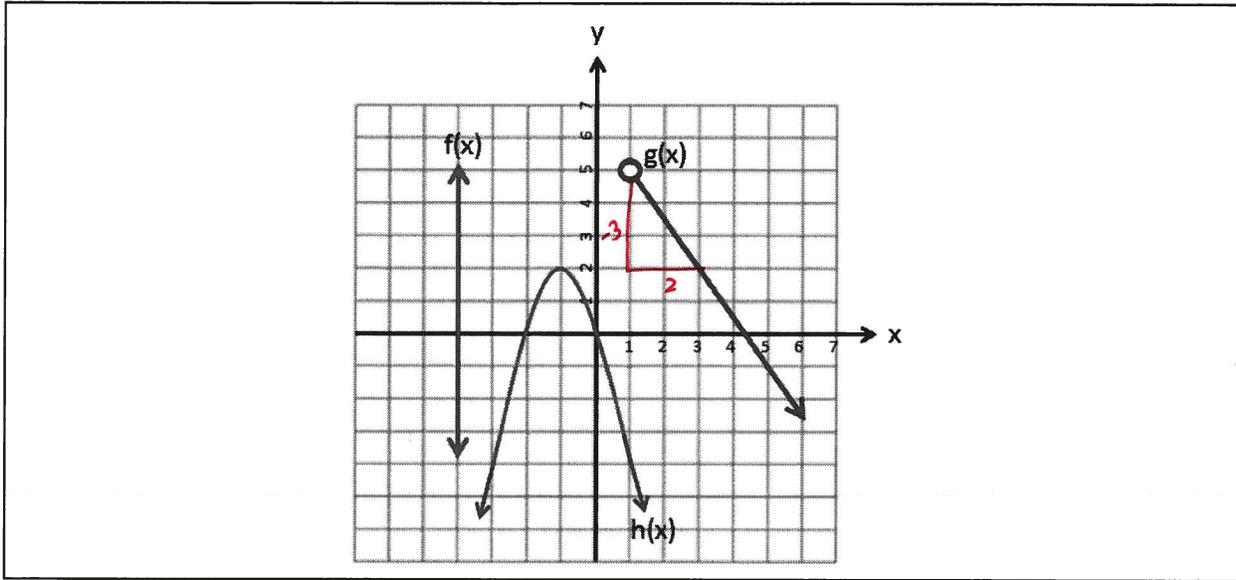
**Chapter 8&9**

- Solving Systems using Graphs
- Solving Systems using Substitution
- Solving Systems using Elimination

*(Notes)* What types of questions do I need to ask for additional help understanding?

Part 1: Graphing – Chapter 6

Use the following information to answer Q1-Q4:



Q1: In the diagram above, there is/are  $\frac{2}{i}$  linear relation(s), and  $\frac{2}{ii}$  function(s) represented.

	<i>i</i>	<i>ii</i>
A.	1	1
B.	1	2
C.	2	1
<b>D.</b>	2	2

$\swarrow$   $f(x)$  is linear  
 $g(x)$  is linear  
 $h(x)$  is not straight

$\swarrow$   $g(x)$  is a function  
 $h(x)$  is a function  
 $f(x)$  fails vertical line test

Q2: Using *Interval Notation*, which best describes the Range of  $g(x)$ ?

- y-values*
- a.  $(1, \infty)$
  - b.  $[1, \infty)$
  - c.**  $(-\infty, 5)$   $\leftarrow$  Can never reach  $-\infty$  or  $+\infty$ , so round brackets.
  - d.  $[-\infty, 5]$

Q3: (Long Answer) Using *Set Notation*, give the *Domain* & *Range* of  $h(x)$ . (2 marks)

Domain:  $\{x \mid -\infty < x < \infty, x \in \mathbb{R}\}$   
 Range:  $\{y \mid -\infty < y \leq 2, y \in \mathbb{R}\}$

Q4: (Long Answer) Determine the slope of  $g(x)$ . (2 marks)

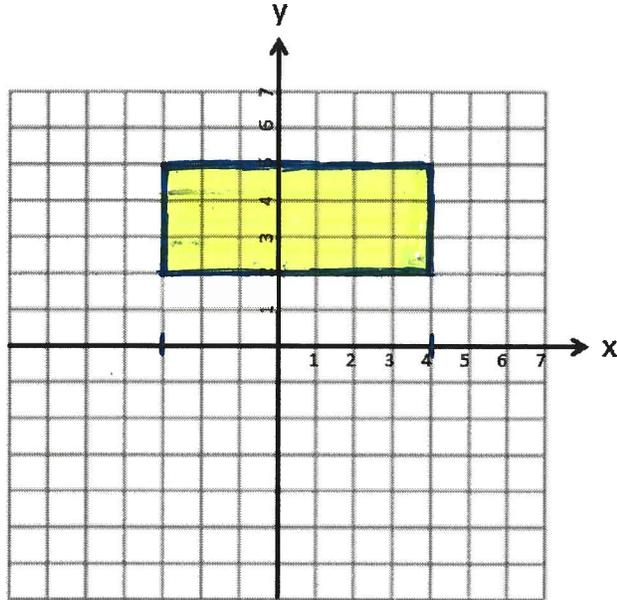
Slope =  $\frac{\text{rise}}{\text{run}} = \frac{-3}{2}$

**Q5:** (Long Answer) Sketch a graph with the following constraints: (1 mark)

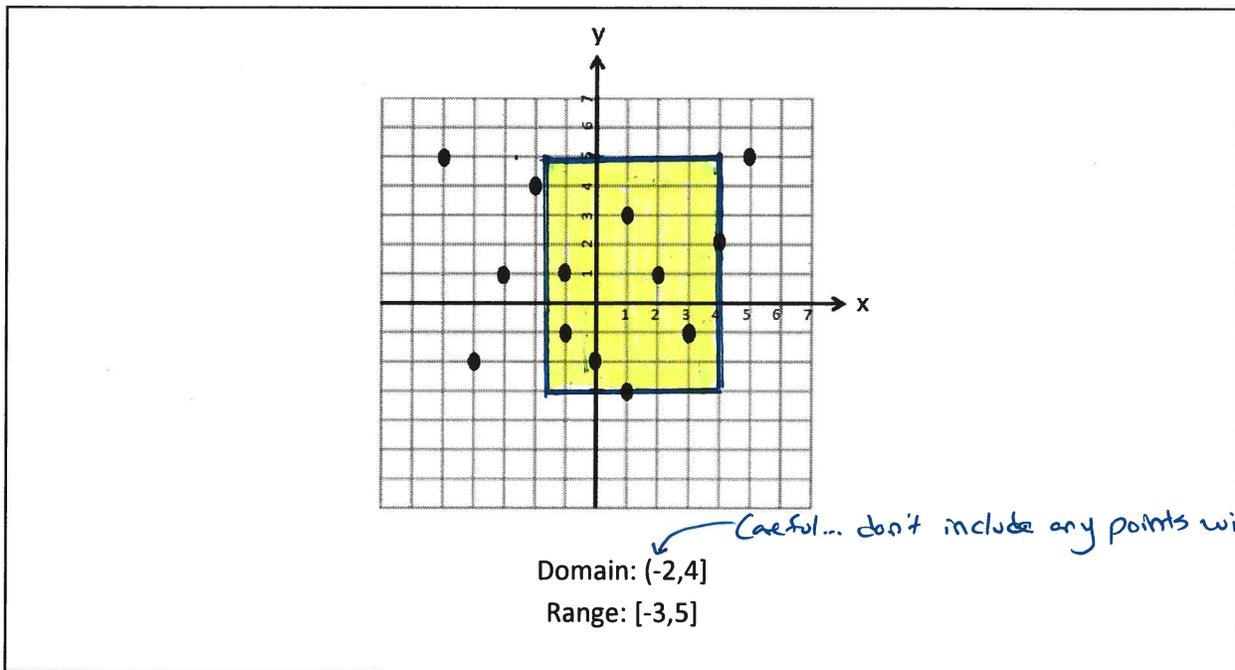
Domain:  $\{x \mid -3 \leq x \leq 4, x \in \mathbb{R}\}$

Range:  $\{y \mid 2 \leq y \leq 5, y \in \mathbb{R}\}$

Graphs will vary, but should stay within the shaded region.



Use the following information to answer Q6:



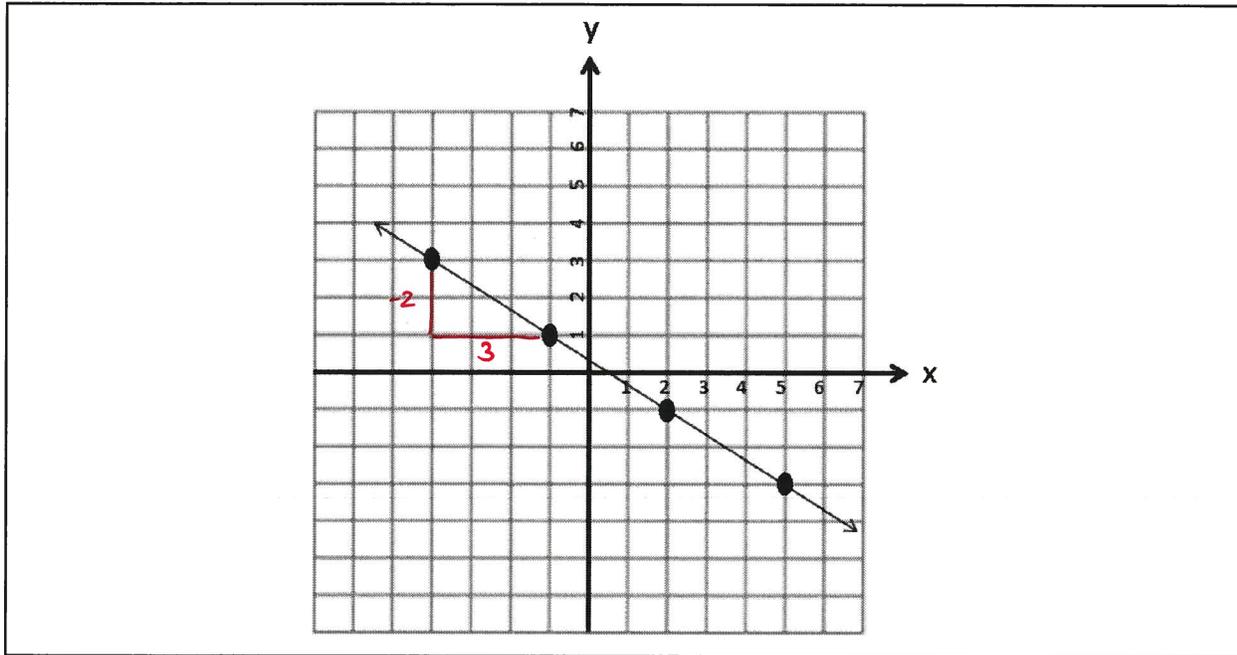
**Q6:** How many data points are within the specified Domain and Range?

(Record your **one digit** answer in the Numerical Response boxes below)

8			
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Part 2: Graphing – Chapter 7

Use the following information to answer Q7-Q8:



Q7: The equation, in *Slope-Point Form*, can be written in the form  $(y - a) = -\frac{b}{c}(x + d)$ , where  $a$ ,  $b$ ,  $c$ , and  $d$  are \_\_\_\_, \_\_\_\_, \_\_\_\_, and \_\_\_\_.

(Record your **four digit** answer in the Numerical Response boxes below)

1 2 3 1

or

3 2 3 4

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

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

so  $a = 1$   
 $b = 2$   
 $c = 3$   
 $d = 1$

or  $a = 3$   
 $b = 2$   
 $c = 3$   
 $d = 4$

Q8: The equation, written in *Slope y-Intercept Form* is  $y = -\frac{e}{f}x + \frac{g}{h}$ , where  $e$ ,  $f$ ,  $g$  and  $h$  are \_\_\_\_, \_\_\_\_, \_\_\_\_, and \_\_\_\_.

(Record your **four digit** answer in the Numerical Response boxes below)

2 3 1 3

$$y = -\frac{2}{3}x + b \quad \text{Use point } (-1, 1)$$

$$1 = -\frac{2}{3}(-1) + b$$

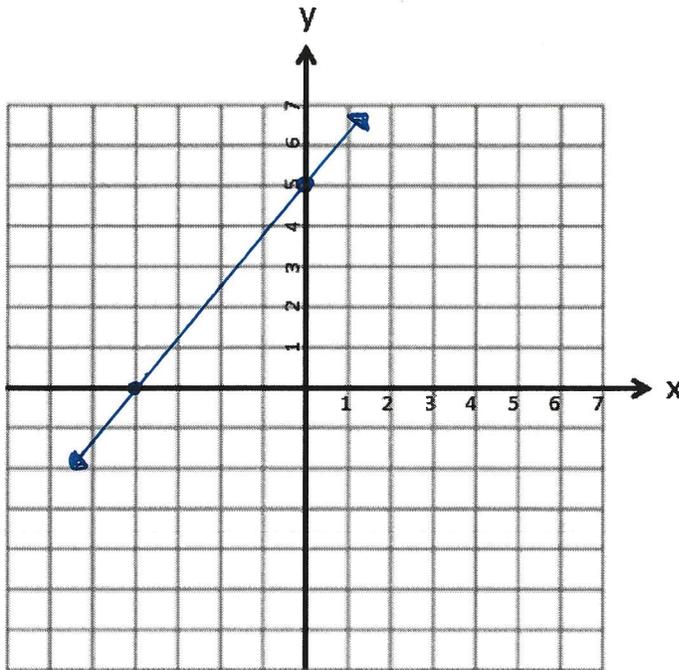
$$1 = \frac{2}{3} + b$$

$$-\frac{2}{3} - \frac{2}{3}$$

$$\frac{1}{3} = b \rightarrow y = -\frac{2}{3}x + \frac{1}{3}$$

$e = 2$   
 $f = 3$   
 $g = 1$   
 $h = 3$

Q9: (Long Answer) Graph the equation  $5x - 4y + 20 = 0$  below. (2 marks).



Method #1: Solve for intercepts

x-int (set  $y=0$ )

$$\begin{aligned} 5x + 20 &= 0 \\ -20 & -20 \\ 5x &= -20 \\ \div 5 & \div 5 \\ \boxed{x = -4} \end{aligned}$$

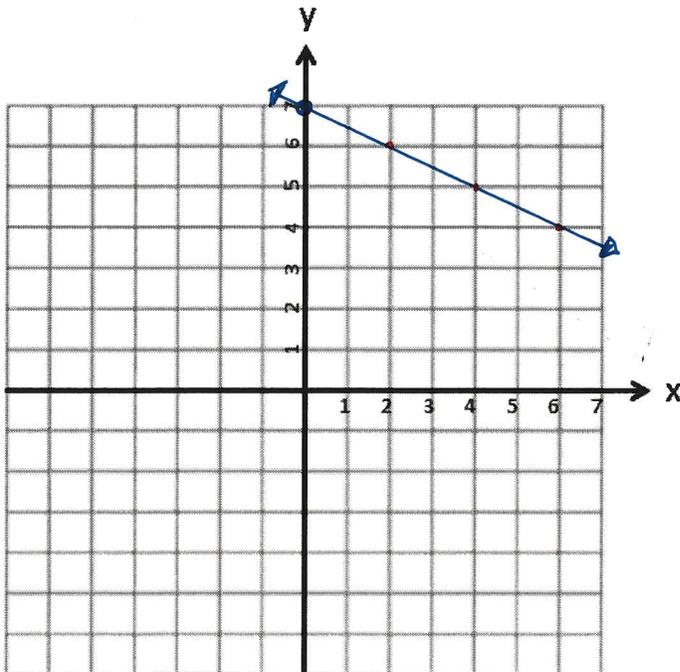
y-int (set  $x=0$ )

$$\begin{aligned} -4y + 20 &= 0 \\ -20 & -20 \\ -4y &= -20 \\ \div (-4) & \div (-4) \\ \boxed{y = 5} \end{aligned}$$

Method #2: Put in  $y = mx + b$  form

$$\begin{aligned} 5x - 4y + 20 &= 0 \\ +4y & +4y \\ 5x + 20 &= 4y \\ \div 4 & \div 4 \quad \div 4 \\ \frac{5}{4}x + 5 &= y \\ \boxed{y = \frac{5}{4}x + 5} \end{aligned}$$

Q10: (Long Answer) Graph the line that is both perpendicular to  $y = 2x - 5$  and passes through the point  $(4, 5)$ . (2 marks)



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

Perpendicular line  $m = -\frac{1}{2}$

$y = mx + b$

$y = -\frac{1}{2}x + b$  Use point  $(4, 5)$

$5 = -\frac{1}{2}(4) + b$

$5 = -2 + b$

$+2 \quad +2$

$7 = b$



$\boxed{y = -\frac{1}{2}x + 7}$

Part 3: Graphing – Chapter 8&9

Q11: (Long Answer) Find the solution to the system of equations via graphing. (3 marks)

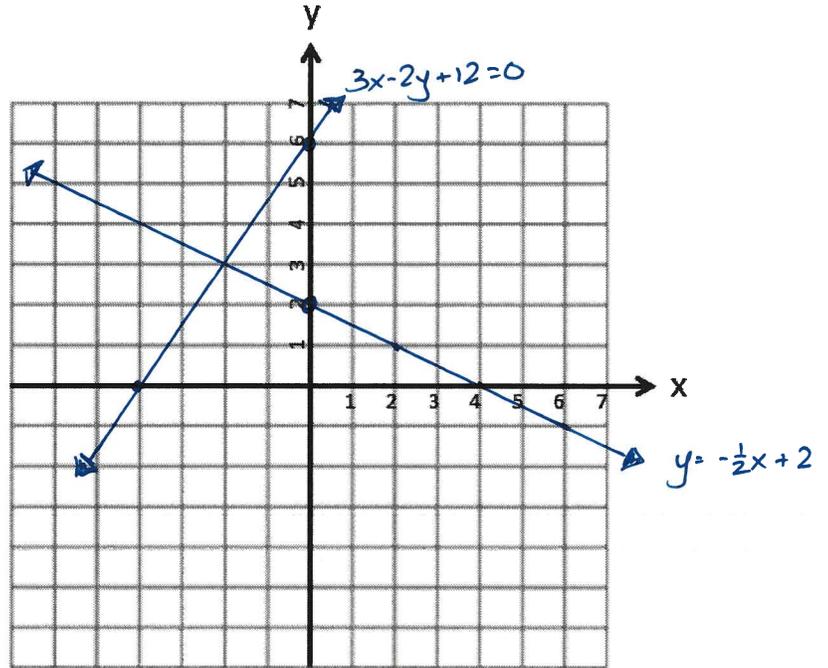
$$3x - 2y + 12 = 0$$

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

$$3x - 2y + 12 = 0$$

$$\begin{aligned} x\text{-int} &= -4 \\ y\text{-int} &= 6 \end{aligned} \quad \text{or} \quad y = \frac{3}{2}x + 6$$

Soln is  $(-2, 3)$



Q12: (Long Answer) Find the solution to the system of equations via graphing. (3 marks)

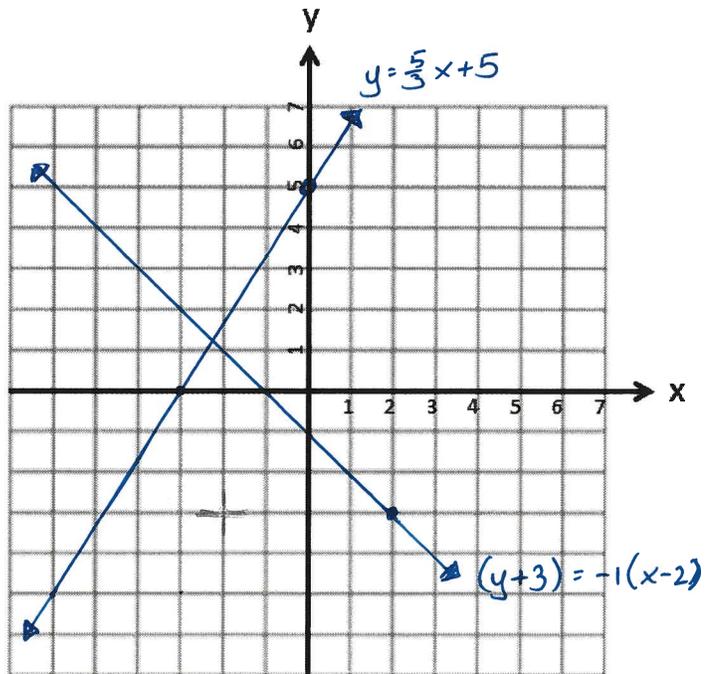
$$y = \frac{5}{3}x + 5$$

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

$$(y - 3) = -1(x - 2)$$

So point  $(2, -3)$

Soln  $\approx (-2.3, 1.3)$



Part 4: Algebra – Chapter 6

Use the following information to answer Q13-Q15:

$f(x) = \frac{1}{2}x + 3$	$g(x) = x^2 + 1$	$h(x) = -\frac{3}{2}x + 5$
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Not linear.

Q13: How many of the functions are linear?

- a. 0
- b. 1
- c. 2**
- d. 3

$f(x)$  and  $h(x)$  are linear (straight lines)

Q14: What is  $f(8)$  = ?

(Record your **one digit** answer in the Numerical Response boxes below)

7			
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$$\begin{aligned}
 f(8) &= \frac{1}{2}(8) + 3 \\
 &= 4 + 3 \\
 &= 7
 \end{aligned}$$

So when  $x=8$ ,  $y=7$ .

Q15:  $h(3) = \frac{a}{b}$ , where  $a$  and  $b$  are \_\_\_ and \_\_\_.

(Record your **two digit** answer in the Numerical Response boxes below)

1	2		
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$$\begin{aligned}
 h(3) &= -\frac{3}{2}(3) + 5 \\
 &= -\frac{9}{2} + 5 \\
 &= \frac{1}{2}
 \end{aligned}$$

$$\begin{aligned}
 a &= 1 \\
 b &= 2
 \end{aligned}$$

Q16: (Long Answer) A line passes through the points (-2,4) and (3,7). What is the slope of the line? (2 marks)

$x_1 \ y_1 \ \quad x_2 \ y_2$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7 - 4}{3 - (-2)} = \boxed{\frac{3}{5}}$$

Part 5: Algebra – Chapter 7

Q17: (Long Answer) Write the equation of the line that passes through the points (4,-2) and (10,3) in Slope y-Intercept Form. (2 marks)

$x_1 \ y_1 \ x_2 \ y_2$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - (-2)}{10 - 4} = \frac{5}{6}$$

$$y = mx + b$$

$$y = \frac{5}{6}x + b \quad \text{Use point (10,3)}$$

$$3 = \frac{5}{6}(10) + b$$

$$3 = \frac{50}{6} + b$$

$$3 = \frac{25}{3} + b$$

$$-\frac{25}{3} = b$$

$$-\frac{16}{3} = b \quad \rightarrow \quad \boxed{y = \frac{5}{6}x - \frac{16}{3}}$$

Q18: The equation  $y = -\frac{1}{2}x + 4$  can be written in the form  $Ax + By - C = 0$ , where  $A$ ,  $B$ , and  $C$  are \_\_, \_\_, and \_\_.

(Record your one digit answer in the Numerical Response boxes below)

1	2	8	
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$$y = -\frac{1}{2}x + 4$$

$$+\frac{1}{2}x \quad +\frac{1}{2}x$$

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

$$-4 \quad -4$$

$$\frac{1}{2}x + y - 4 = 0$$

$$\times 2 \quad \times 2 \quad \times 2 \quad \times 2$$

$$1x + 2y - 8 = 0$$

$$A = 1$$

$$B = 2$$

$$C = 8$$

**Q19:** (Long Answer) A line is perpendicular to  $3x - 4y + 10 = 0$  and passes through the point  $(4,8)$ . Write the equation of the line in General Form. (2 marks)

$$\begin{array}{l}
 3x - 4y + 10 = 0 \\
 \quad +4y \quad \quad +4y \\
 3x + 10 = 4y \\
 \div 4 \quad \div 4 \quad \div 4 \\
 \frac{3}{4}x + \frac{5}{2} = y \\
 y = \frac{3}{4}x + \frac{5}{2} \\
 \Downarrow \\
 \text{slope} = \frac{3}{4}
 \end{array}$$

Perpendicular slope =  $-\frac{4}{3}$

$$\begin{array}{l}
 y = mx + b \\
 y = -\frac{4}{3}x + b \quad \text{Use } (4,8) \\
 8 = -\frac{4}{3}(4) + b \\
 8 = -\frac{16}{3} + b \\
 \quad +\frac{16}{3} \quad +\frac{16}{3} \\
 \frac{40}{3} = b \\
 y = -\frac{4}{3}x + \frac{40}{3}
 \end{array}$$

$$\begin{array}{l}
 y = -\frac{4}{3}x + \frac{40}{3} \\
 \quad +\frac{4}{3}x \quad +\frac{4}{3}x \\
 \frac{4}{3}x + y = \frac{40}{3} \\
 \quad \quad -\frac{40}{3} \quad -\frac{40}{3} \\
 \frac{4}{3}x + y - \frac{40}{3} = 0 \\
 \times 3 \quad \times 3 \quad \times 3 \quad \times 3 \\
 \boxed{4x + 3y - 40 = 0}
 \end{array}$$

Use the following information to answer Q20-Q21:

A Stettler resident leaves their home to travel to Red Deer. At 10 minutes they are 30km outside of town. At 20 minutes they are 45km outside of town.

**Q20:** (Long Answer) Calculate the slope and explain what it represents. (2 marks)

$\frac{\text{Distance}}{y}$  depends on  $\frac{\text{time}}{x}$   $\rightarrow$   $(10, 30)$  and  $(20, 45)$   
 $x_1 \quad y_1 \quad \quad \quad x_2 \quad y_2$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{45 - 30}{20 - 10} = \frac{15}{10} = \boxed{1.5}$$

The slope represents a speed of 15 km per minute (or 90 km per hour).

**Q21:** (Long Answer) Calculate the y-intercept and explain what it represents. (1 marks)

$$\begin{array}{l}
 y = mx + b \\
 y = 1.5x + b \quad \text{Use } (10, 30) \\
 30 = 1.5(10) + b \\
 30 = 15 + b \\
 \quad -15 \quad -15 \\
 15 = b
 \end{array}$$

$$y = 1.5x + 15$$

$\Downarrow$  The person's house (starting point) is 15km outside of town.

Part 6: Algebra – Chapter 8&9

Q22: (Long Answer) Solve the system of equations using Substitution. (2 marks)

$$\begin{aligned}
 2x + y + 8 = 0 &\longrightarrow y = -2x - 8 \\
 3x - 4y + 10 = 0 & \quad 3x - 4y + 10 = 0 \\
 & \quad 3x - 4(-2x - 8) + 10 = 0 \\
 & \quad 3x + 8x + 32 + 10 = 0 \\
 & \quad 11x + 42 = 0 \\
 & \quad \quad -42 \quad -42 \\
 & \quad 11x = -42 \\
 & \quad \div 11 \quad \div 11 \\
 & \quad \boxed{x = \frac{-42}{11}}
 \end{aligned}$$
  

$$\begin{aligned}
 & \longrightarrow y = -2\left(\frac{-42}{11}\right) - 8 \\
 & \quad y = \frac{84}{11} - 8 \\
 & \quad \boxed{y = \frac{-4}{11}} \\
 & \quad \boxed{\text{soln is } \frac{-42}{11}, \frac{-4}{11}}
 \end{aligned}$$

Q23: (Long Answer) A restaurant sells 2 hotdogs and 3 burgers for \$12.80 to one customer, and 5 hotdogs and 1 burger for \$11.85 to a second customer. What is the price of each hotdog and each burger? Solve using Elimination. (5 marks)

Let  $x$  = price of hotdog  
 $y$  = price of hamburger

$$\begin{aligned}
 2x + 3y = 12.80 \\
 3(5x + 1y = 11.85) &\longrightarrow \begin{array}{r} 2x + 3y = 12.80 \\ - (15x + 3y = 35.55) \\ \hline -13x = -22.75 \\ \div (-13) \quad \div (-13) \\ \boxed{x = 1.75} \end{array} \\
 \downarrow \\
 5(1.75) + 1y = 11.85 \\
 8.75 + 1y = 11.85 \\
 -8.75 \quad -8.75 \\
 \boxed{1y = 3.10}
 \end{aligned}$$

Hotdogs cost \$1.75 each.  
 Hamburgers cost \$3.10 each.