

Name: _____

Exam Review

Part A: Data Management Unit

1. A group of students playing in the snow decide to organize a toboggan competition. The person who travels the longest distance is the winner.
 - a. What factors might affect the distance traveled?
 - b. What is the independent variable?
 - c. What is the dependent variable?
2. Find the mean, median and mode and range for the following numbers. Which is the best measure of central tendency to describe the data?
74, 52, 46, 81, 77, 49, 75, 62, 74, 84, 56, 12, 98
3. With the following:

12.4	6.7	5.1	24.3	13.1	15.4	7.0
13.7	24.6	1.4	20.7	7.6	21.1	1.2
22.4	17.2	12.6	18.3	12.4	17.0	14.5
19.1	21.3	17.6	16.4	9.2	23.3	20.1

- a. Construct a stem-and-leaf plot.
 - b. Construct a box-and-whisker plot.
 - c. Create a histogram (bin widths of 0-5, 5-10, 10-15, 15-20, 20-25)
4. Determine the standard deviation for each group below.

Group 1		
17	24	15
21	19	23
8	11	18
7	22	6
2	17	9
Group 2		
31	37	32
42	29	36
36	43	44
28	47	25
45	27	38

5. The test scores for 32 students are normally distributed. The mean is 74 and the standard deviation is 7.
 - a. How many students scored more than 81?
 - b. How many students scored between 67 and 88?
 - c. How many students failed?
6. The base charge of a taxi is \$5.00, plus \$0.30 per kilometer.
 - a. What is the dependent variable
 - b. What is the independent variable
 - c. Write the equation
 - d. What distance could be traveled for \$32.00

Part B: Patterns, Relation and Equations Unit

True or False (number types)

1. Natural numbers are a type of whole numbers _____
2. Integers are a type of real numbers _____
3. Real numbers are a type of whole numbers _____
4. Whole numbers are also called counting numbers _____
5. Irrational numbers never include decimals _____
6. Rational numbers have decimals that never end and do not repeat _____
7. The symbol for natural numbers is an N _____
8. The symbol for rational numbers is a Q. _____
9. Rational and irrational numbers make up all the real numbers _____
10. Integers can be thought of as every whole number, as well as their negatives. _____

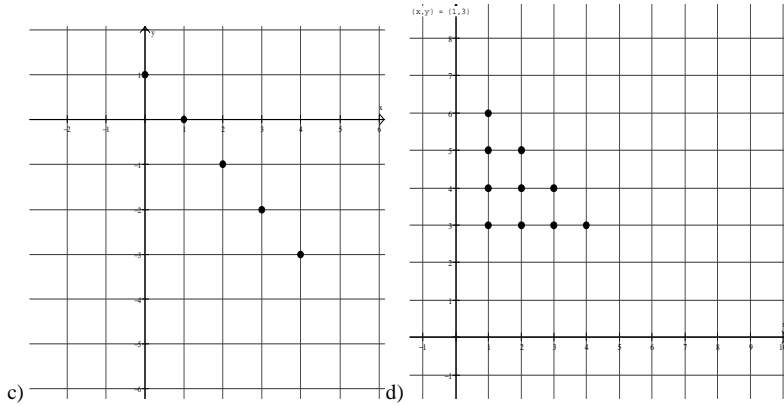
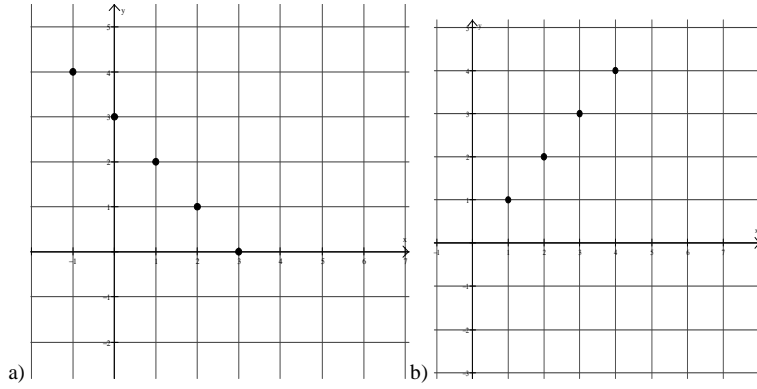
Fill in the following table.

Number	Number Set(s)
$\sqrt{2}$	
$\frac{8}{9}$	
-3	
0	

2. What are the domain and the range of the relationship given by this table of values?

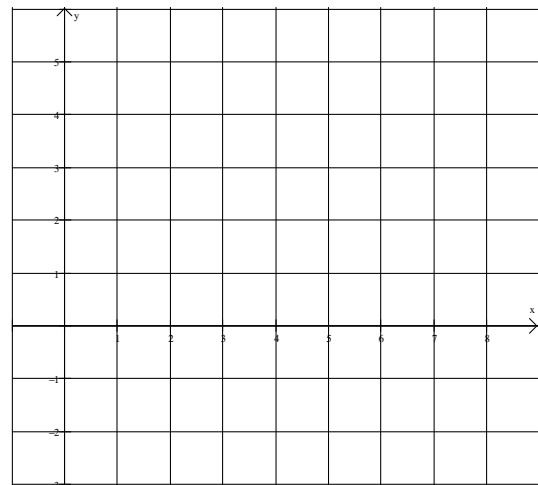
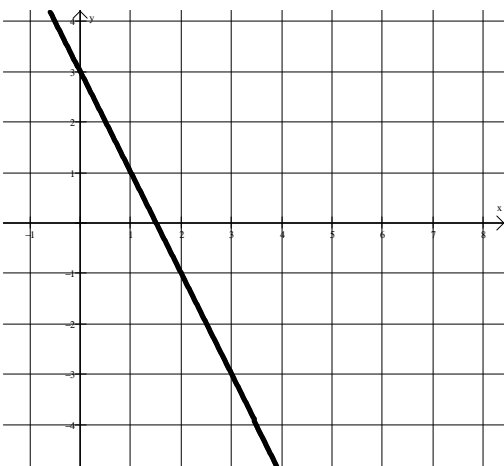
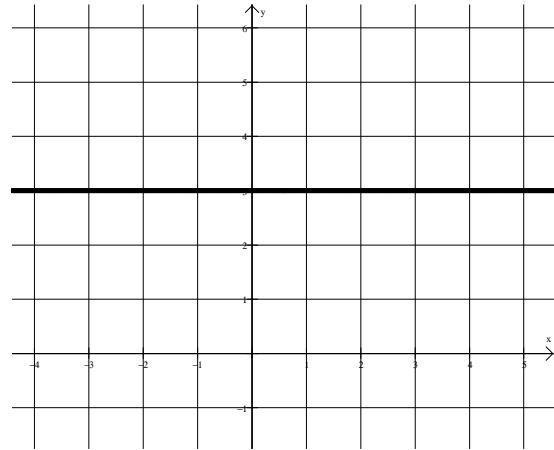
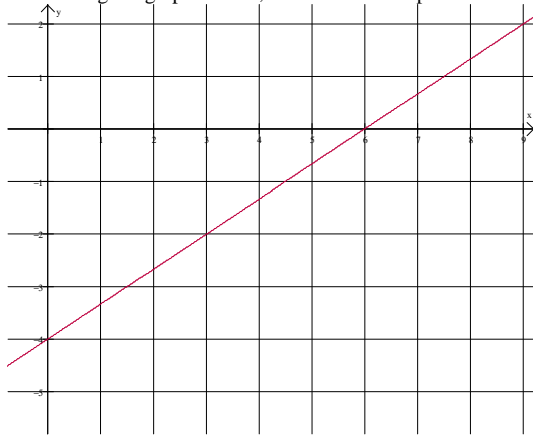
X	4	3	5	1	1	2	5	3	3	7
Y	3	3	4	0	2	2	4	4	3	6

3. For each relation shown on the graph, write:
 - (i) the ordered pairs of the relations
 - (ii) the domain of the relation
 - (iii) the range of the relation



Slope and Equation of the line

1. Using the graphs below, determine the slope of the line.



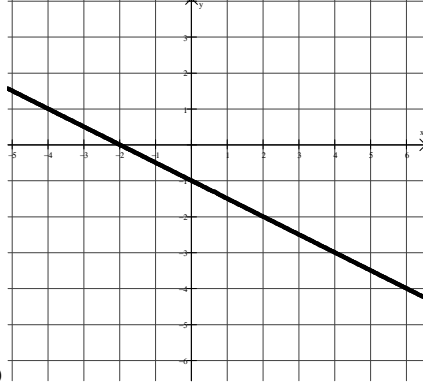
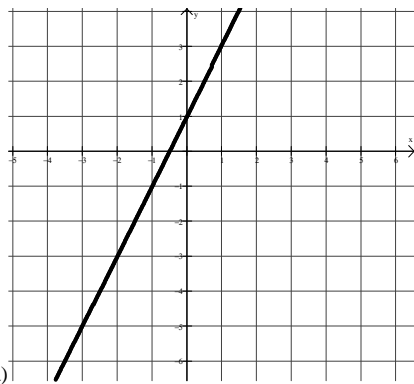
2. Determine the slope of a line that travels through the following points.

- a) (2, 1) and (4,8) b) (-1, 4) and (3, -2) c) (0,0) and (2, 5) d) (3, 5) and (1, 5)

3. Determine the slope and y-intercept for the following equations:

- a) $y = -3x + 2$ b) $y = -5x - 6$ c) $y = \frac{x}{2} + 2$ d) $y = -x$ e) $2x + y = 5$ f) $3x - 6y = 1$

4. Using the slope and y - intercept from the graphs below, determine the equation of the following lines.



- a) b)
5. Use slope and y-intercept to sketch the graph of $y = -2x - 5$.

Section 3.1

1. Fran was driving a motorcycle. She recorded the gas consumed each hour of her trip.

Time (h)	0	1	2	3	4	5
Gas Consumed (L)	0	0.5	1.0	1.5	2.0	2.5

- Describe the pattern in the table of values.
- Sketch a graph for the data.
- Describe how the pattern in (a) shows up in the graph.
- Predict the amount of gas that the motorcycle would consume in 6h. Explain how you found your answer.
- Write the domain and range for your relationship
- Is the graph displaying discrete or continuous data? Explain your answer.

Intersection Points

1. Mr. Simpson is having legal troubles and needs to hire a lawyer. One lawyer charges a base rate of \$200 plus \$50 per hour. Another lawyer charges a base rate of \$300 plus \$30 per hour.

- For each lawyer, write an equation for the situation.
- Graph both equations on the same set of axes, using an appropriate scale and clearly labeling which line belongs to which lawyer.
- Using your graph, determine the number of hours at which the 2 situations would be equal.
- Using your graph, determine at what cost the 2 situations are equal.
- Show how you could solve question c without using your graph.

Changing Words to Equations

Choose a variable for the unknown and write an equation to represent the sentence.

- Twice a number, increased by 8 is 30.
- A number divided by 6 equals 10.
- Four less than three times a number results in 41.
- The sum of two consecutive numbers is 21.
- A number reduced by 5 results in 13.
- Ten less than a number is the same as 15.
- A number doubled and then decreased by 7 results in 43.
- Seven times a number is 5 greater than forty four.
- The sum of a number and twice the number gives a result of nine.
- Five times a number, divided by four, is the same as twelve.
- Three times the volume decreased by 20.
- One third of Tom's age 10 years from now.
- If 37 is added to a certain number, the sum is 53. What is the number?
- A number is doubled and the result is increased by 27. If the sum is now 73, what is the number?
- If one-half of a number is 16, what is the number?
- What number if tripled and the result diminished by 36 gives twice the original number?
- If you add 19 to a certain number the sum is the same as if you add 7 to twice the number. Find the number.
- When I double a certain number and add 16, the result is 40. What is the number?
- Five times a certain number is 45, what is the number?
- The number of students in a class is 33 and the number of boys is 7 greater than the number of girls. Find the number of boys.

Word Problems

- An internet provider, Company A, has just opened up in your area. You receive a flyer from them. Your home needs internet service and you decide to figure out how much it would cost you to use the internet if:
 - The cost is \$20 per month
 - And the company charges \$2.00 per hour
 How many hours of internet use could you get for \$48 dollars?
- Suppose Company C opens up an internet business down the street and they charge:
 - \$10 per month
 - Plus \$2.50 per hour
 How much would it cost to use Company C's internet for 14 hours?
- Which Company is more cost effective, company A or C? Why?
- The cost of using Internet depends on the number of hours of use. Two internet companies provide two options for customers:

Option 1: Cost = \$10 + \$3 per hour

Option 2: Cost = \$30 + \$1 per hour

Which option allows for the greatest number of pages if the total cost is: a) \$40 b) \$70

5. Anne and her friends take a taxi to the Crash Test Dummies concert, 12km from their school. The cost of a taxi is \$2.00 to start and \$0.60 for every minute.
- Find the total cost of the 23 minute ride to the concert. Assume a partial ride is charged a part of the \$0.60
 - Anne graphed this relationship. Should she join the points of the graph? Explain.
 - The cost of returning home was \$17.00. How long was the trip?

Point Form Slope and Parallel/Perpendicular Slope

- Find the equation of a line that passes through the point (4, 2) and having a slope of 2.
- Find the equation of a line that passes through the point (1, -6) and has a slope of $\frac{1}{3}$
- Find the equation of a line that passes through the points (5, 1) and (-1, 6).
- Find the equation of a line that passes through the point (1, -2) and has the same y-intercept as $y = 6x + 4$.
- Write the slope of a line that is parallel to the following lines.
 - $y = -3x - 1$
 - $4 = 4x + 2y$
 - $3x - y - 2 = 0$
- Write the slope of the line that is perpendicular to the following lines.
 - $y = 4x - 3$
 - $3x + y = 7$
 - $0 = -2x + 5y + 3$

Exponents

- Find the value of each of the following.
 - 3^3
 - 3^{-1}
 - 3^0
 - 4^2
 - 4^{-2}
 - $25^{\frac{1}{2}}$
 - $\frac{1}{3^2}$
 - $\frac{1}{4^{-2}}$
 - $\frac{4^0}{4^2}$
- Simplify each of the following.
 - $\frac{x^8}{x^5}$
 - $(k^4)(k^5)$
 - $(ab)^5$
 - $\left(\frac{k}{m}\right)^3$
 - $(m^2)^5$
 - $(3a)^4$
 - $(2xy)^3$
 - $(x^2y)(xy^2)(xy)$
 - $2^3 \times 2^4$
- Simplify. Write your final answer with positive exponents.
 - $\frac{x^6}{x^2}$
 - $\frac{x^8y^2}{x^2y^4}$
 - $\frac{10^2 \times 10^4}{10^3}$
 - $\frac{(s^2t)^2}{s^{-3}t^2}$
 - $\frac{x^2y^4}{-x^4(y^2)^2}$
 - $\frac{-(ab^{-1})^2}{a^{-3}b^4}$

Combining Like Terms

- Simplify each of the following.
 - $3a - 2b + 2a$
 - $-4m - 2n + 5m$
 - $2p + 3q - 2q + 3p$
 - $3y^2 - 4y - 6 - 3 - 2y - 4y^2$
 - $(6x - 2y) - (3x - 4y)$
 - $(2x - 3y) + (5x - 5y) - (2y - 3x)$
 - $a - b - (3a - 2b) - (6a - 5b)$
 - $(x^2 - 2x) - (x^2 - 3x) - (2x^2 - 10)$
- Expand and simplify.
 - $3(x - y) - 2(x + y)$
 - $3(x - 2y + z) + 2(2x - 3y + z)$
 - $4(2a - 4b - c) - 3(3a - 2b - 3c)$
- Evaluate each of the following for $x = -3$, and $y = 2$.
 - $2(x - 2y) - 3(2x - y)$
 - $4(x - 3y) - 2(x - 5y) - 4(x - 2y)$
 - $2x(x - 2) - 3x(4 - x) - 6x(x - 5)$

Multiplying and Dividing Polynomials

- Simplify each product.
 - $(2x)(-3y)$
 - $(-3x)(-3x)$
 - $(-4xy)(-2xy)$
 - $-(3ab)(2ab)$
 - $(3x^2)(-4x^2)$
 - $-(2x^2y)(-3xy^2)$
 - $\frac{36x^3y^5}{9xy^2}$
 - $\frac{3xy}{y}$
 - $(-25xy^2) \div (5xy)$
 - $\frac{(2x)(-4xy)}{2x^2}$
 - $\frac{(-8x^2)(-2x)(-3x)}{-12x^3}$
 - $\frac{-25mx + 5xy}{-5x}$

Foil

- $(x + 3)(x - 3)$
- $(y - 10)(y + 10)$
- $(4x + 3)(4x - 3)$
- $(b - a)(b + a)$
- $(x - 8)^2$
- $(a + 5)^2$
- $(6x + 1)^2$
- $(4x - y)^2$
- $(x - 9y)(2x + y)$
- $(4x - 2)(x + 7)$
- $(a - 2b)(3a^2 - 2ab + b^2)$
- $(3x - 2)(2x^2 - 2x + 1)$
- $(x - 4)(x - 3) - 2(x - 4)(x + 5)$
- $(a - 3)(2a - 2) + 2(2a + 3)(2a - 1)$
- $3(2 - y)(3 + y) - 4(y - 6)(y + 5)$

Common Factoring

- $y^5 - y^4 + y^3 - y^2$
- $36x^5 - 9y^3$
- $8wx - 12x$
- $15x + 10y$
- $18r^2s^3 - 9rs^2 - 27r^3s^2$
- $3mx + 3my + 2x + 2y$
- $5wx - 10w - 3tx - 6t$
- $5y(m + n) + t(m + n)$
- $9x(m + 3) - 2(m + 3)$
- $4mnx - 16mn - x + 4$