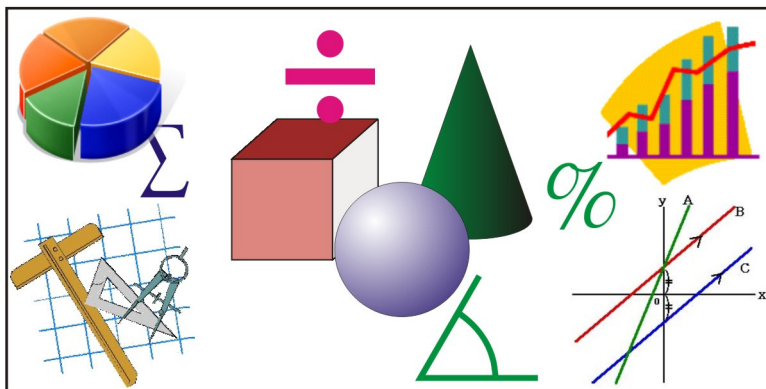


New!

**RAVEN'S GUIDE TO
SASKATCHEWAN
MATHEMATICS GRADE 9**

**LINKED DIRECTLY TO NEW CURRICULUM REQUIREMENTS
FROM THE WESTERN PROTOCOLS FOR 2008 AND BEYOND**

**STUDENT GUIDE AND
RESOURCE BOOK**



**Key to Student Success
with Grade 9 Mathematics**

**One of a series of publications by Raven Research Associates
for Secondary and Elementary Mathematics**

**Alan R. Taylor, Ed. D.
Bill Kokoskin, M.A.**

Raven Research Associates, Inc.

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Table of Contents

	p.		p.
Chapter 1 - Number Concepts		Chapter 5 Polynomials	
1.1 The Real Number System	2	5.1 Constant Terms, Coefficients, and Variables in Polynomials	113
1.2 Square Root of a Number	10	5.2 Simplifying Polynomials	116
1.3 Powers, Bases and Coefficients	20	5.3 Addition and Subtraction of Polynomials	118
1.4 Laws of exponents	26	5.4 Multiplying Polynomials by Monomials	120
		5.5 Dividing a Polynomial by a Monomial	123
Chapter 2 – Number Operations		Chapter 6 - Circles	
2.1 Operations Rational Numbers	37	- Review of Geometry	129
2.1.1 Operations with Integers (Review)	37	- Review of Circles	133
2.1.2 Operations with Fractions (Review)	40	6.1 Chord Properties	135
2.1.3 Operations with Decimals (Review)	44	6.2 Angles in Circles	139
2.1.4 Order of Operations	46	6.3 Tangents and Circles	147
2.2 Working with Percents (Review)	49		
2.3 Calculations Using Scientific Notation	51	Chapter 7 - Measurement	
2.4 Evaluating Exponential Expressions with Numerical Bases	52	7.1 Review of Area and Perimeter	156
2.5 Using Laws of Exponents to Simplify Expressions with Variable Bases	54	7.2 Review of Surface Area and Volume of a Prism	161
		7.3 Review of Surface Area and Volume of a Cylinder	166
Chapter 3 - Expressions, Equations and Graphs		7.4 Surface Area of Composite 3-D Objects	169
3.1 Translating Words & Algebraic Expressions	62	Chapter 8 - Comparing Figures	
- Written Statements to Algebraic Expressions	62	8.1 Congruent Triangles	177
- Algebraic Expressions to Written Statements	62	8.2 Similar Triangles	183
3.2 Generalizing Patterns in Problem Solving	65	8.3 Similar Polygons	188
3.3 Modeling Situations Represented by 1 st Degree Expressions	68	8.4 Enlargements and Reductions	191
3.4 Tables of Values and Linear Equations	72	8.5 Scale Diagrams	194
3.5 Graphs and Linear Relationships	79		
		Chapter 9 - Transformations	
Chapter 4 - Variables, Equations & Inequalities		9.1 Line Symmetry	202
4.1 Solving and Verifying First-Degree Equations	89	9.2 Rotation Symmetry	207
4.1.1 Review	89	9.3 Translations	211
4.1.2 Solving Equations of the form $ax + b = cx$ and $ax + b = cx + d$	92	9.4 Reflections	215
4.1.3 Solving Equations of the form $a(x + b) = c$ and $a(bx + c) = d(ex + f)$	94	9.5 Rotations	219
4.1.4 Solving equations form $\frac{a}{x} = b$	96	9.6 Combining Transformations	223
4.2 Solving First Degree Inequalities Algebraically	98	9.7 Dilations	226
4.2.1 Review	98	Chapter 10 – Data Analysis	
4.2.2 Inequalities with more than one operation	101	10.1 Populations and Samples	233
4.3 Using Equations to Solve Problems	103	10.2 Conducting a Survey/Collecting Data	238
4.4 Using Inequalities to Solve Problems	107	10.3 Misuse of Statistics and Probability	241
		Appendix	251
		Answers to Exercises and Chapter Tests	

SAMPLE FROM RAVEN GRADE 9 MATH

3.4 Tables of Values and Linear Equations

- When data about two variables are collected it is usually put into a table of values so a relationship between the variables can be more easily recognized.
- In this section we will only be looking at linear relationships. If, for example, the two variables we are looking at are x and y , then the relationship between x and y may take on one of the following forms:

$y = x$ (multiplied by a number)	e.g. $y = 4x$
$y = x$ (divided by a number)	$y = \frac{x}{4}$ or $y = \frac{1}{4}x$
$y = x$ (plus a number [added])	$y = x + 4$
$y = x$ (minus a number [subtracted])	$y = x - 4$
A combination of the above	$y = 4x - 3$ or $y = \frac{1}{4}x + 3$

Example 1

Discover the relationship between x and y in each table below by completing the table then write the relationship between x and y as an equation.

a)

x	1	2	3	4	5	6	7	8	0
y	3	6	9	12					

Solution: y is three times x . Completing the table we get the following:

x	1	2	3	4	5	6	7	8	0
y	3	6	9	12	15	18	21	24	0

The equation is $y = 3x$.

b)

x	2	4	6	8	10	12	14	16
y	5	7	9	11				

Solution: y is 3 more than x . Completing the table we get the following:

x	2	4	6	8	10	12	14	16
y	5	7	9	11	13	15	17	19

The equation is $y = x + 3$.

- If we are given the equation to start with, we can easily make a table of values. Some values are easier to substitute than others, for instance “0”, and “1”.

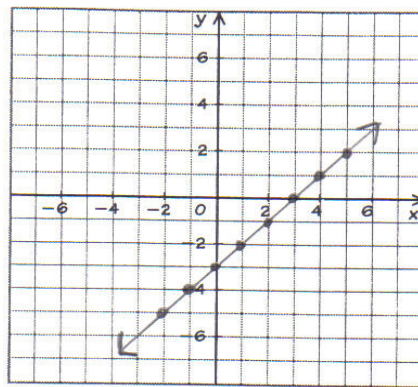
Example 2

Given the following equations, make a table of values, then graph the equations on the grid provided.

a) $y = x - 3$

Solution:

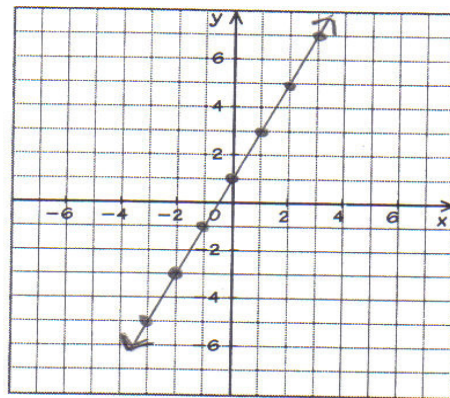
x	0	1	2	3	4	5	-1	-2
y	-3	-2	-1	0	1	2	-4	-5



b) $y = 2x + 1$

Solution:

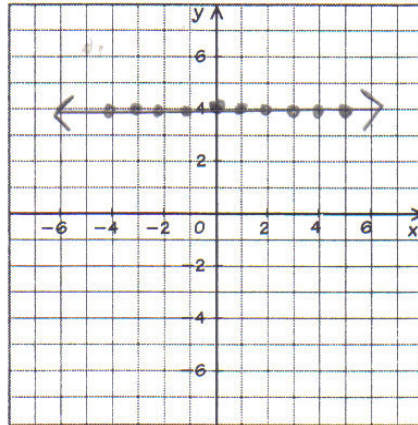
x	0	1	2	3	-1	-2	-3	-4
y	1	3	5	7	-1	-3	-5	-7



Some graphs turn out to be vertical lines and some horizontal lines. For example if the table of values was:

x	0	1	2	3	4	5	-1	-2	-3	-4
y	4	4	4	4	4	4	4	4	4	4

Then the graph would look like:

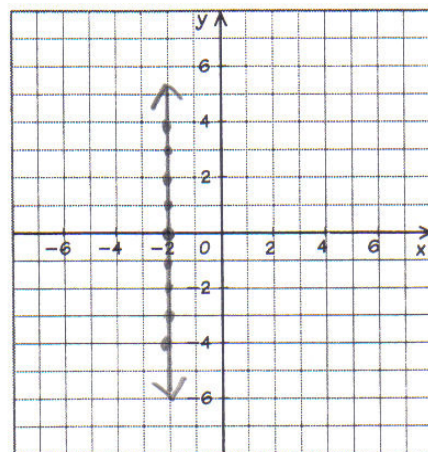


$\therefore y = 4$ would be the equation

If the table of values was as follows:

x	-2	-2	-2	-2	-2	-2	-2	-2	-2
y	0	1	2	3	4	-1	-2	-3	-4

Then the graph would look like the following.



$\therefore x = -2$ would be the equation

Exercises 3.4

1. Discover the relationship between x and y in each table below by completing the table then write the relationship between x and y as an equation

a)

x	2	4	6	8	10	12	14	16
y	50	100	150	200				

b)

x	5	6	7	8	9	10	11	12
y	7	8	9	10				

c)

x	20	21	22	23	24	25	26	27
y	17	18	19	20				

d)

x	10	20	30	40	50	60	70	80
y	2	4	6	8				

e)

x	5	10	15	20	25	30	35	40
y	21	41	61	81				

2. Discover the relationship between the variables in each table below by completing the table then write the relationship between these variables as an equation.

a)

Number of books N	1	2	3	4	5	6	7	8
Cost C	4	8	12	16				

b)

Hours H	5	10	15	20	25	30	35	40
Salary S (\$)	37.50	75	112.50	150				

c)

Selling Price S	100	200	300	400	500	600	700	800
Profit P	20	40	60	80				

d)

Number Sold N	5	6	7	8	9	10	11	12
Profit P	7.50	8.50	9.50	10.50				

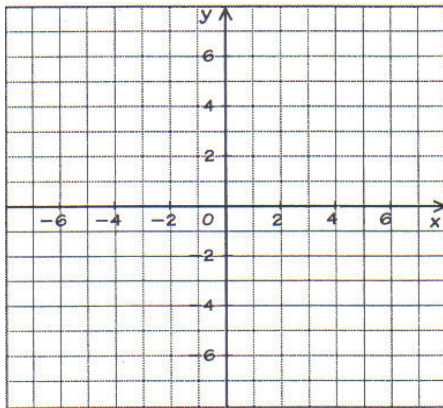
e)

Distance D	0	5	10	15	20	25	30	35
Cost C	3.00	10.50	18.00	25.50				

3. Make a table of values for each equation below with at least 4 points in each table, then graph each equation on the grid provided.

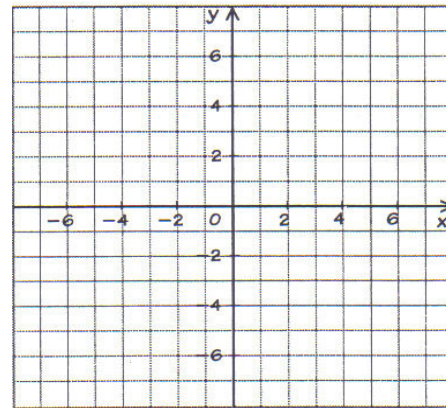
a. $y = 3x$

x				
y				



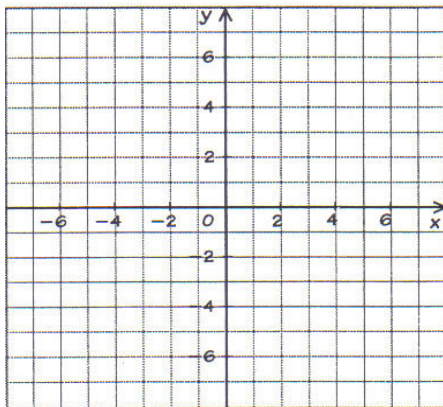
b. $y = x + 3$

x				
y				



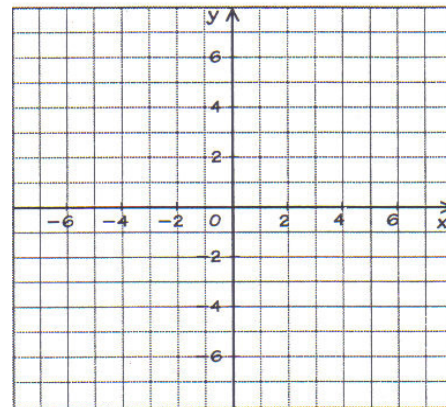
c. $y = 2x - 5$

x				
y				



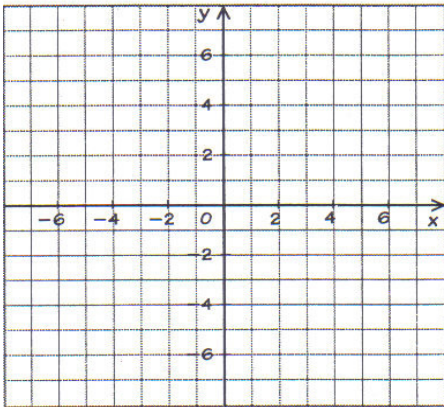
d. $y = -\frac{1}{2}x + 4$

x				
y				



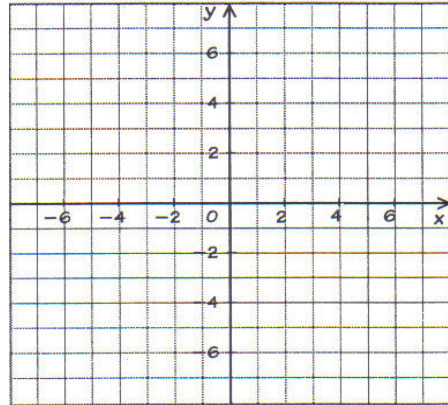
e. $3x - 2y = 6$

x				
y				



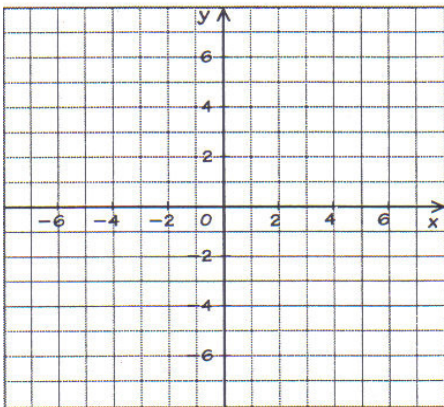
f. $2x - 3y = 4$

x				
y				



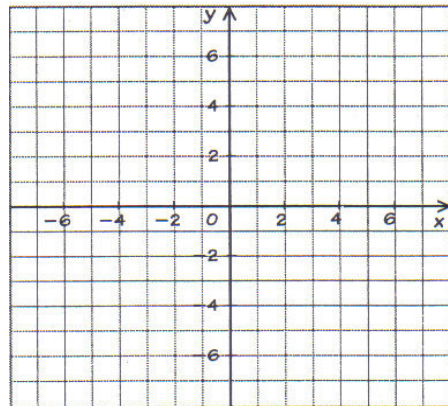
g. $y = -5$

x				
y				



h. $x = 4$

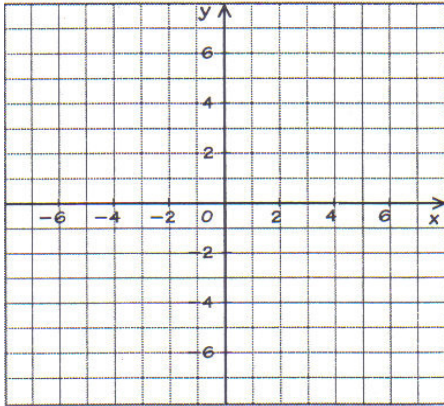
x				
y				



4. For each table of values, sketch them on the grid and determine a rule that expresses the relationship between x and y.

a.

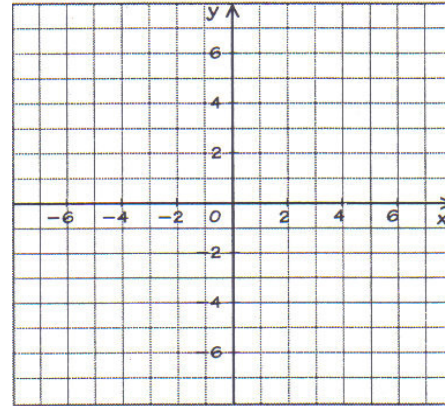
x	0	1	2	3	4	5
y	-1	2	5	8	11	14



Rule:

b.

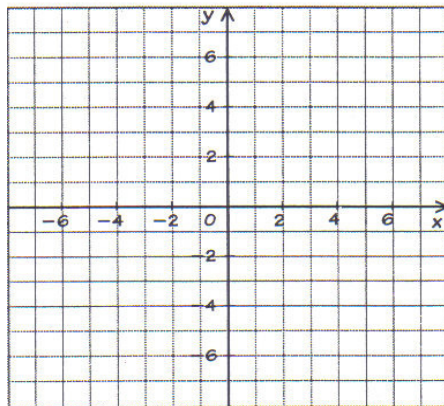
x	0	2	4	-2	-4	-6
y	-2	-1	0	-3	-4	-5



Rule:

c.

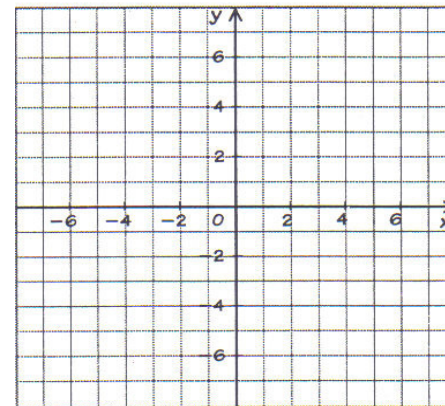
x	0	1	2	3	4	5	6
y	5	3	1	-1	-3	-5	-7



Rule:

d.

x	-3	-1.5	2.5	6	8
y	7.5	6	2	-1.5	-3.5



Rule: