Day	*Date*	*Lesson*	*Assigned Work*	*Done (✓)*
1	Fri May 12	Review: Units 1, 2 & 4 (Chapters 2-3)	Pages 98 # 1 - 4, 7 - 8 (ch. 2) Pages 178-179 # 5, 11 - 19, 21 - 23 (ch 2, 3)	
3	Tues May 16	Review: Units 3 & 5 (Chapter 4 and 5)	Page 356 # 1 - 6 (ch. 4) Page 232 # 1 - 6 (ch. 4) Pages 356-357 # 7 - 11 (ch. 5) Pages 290 - 291 # 1 - 10 (ch. 5)	
1	Thurs May 18	Review: Unit 6 (Chapter 6)	Page 357 # 13 - 18 (ch. 6) Page 355 # 6, 9, 12 (ch. 6)	
3	*Mon May 22 (Victoria Day)* Tues May 23	Review: Unit 7, 8 & 9 (Chapters 7, 8 and 9)	Pages 520-521 # 1, 2, 4, 7 (ch. 7) Pages 410 # 1 - 7, 9, 10 (ch. 7) Page 520 # 8-15, 16a (ch. 8, 9) Pages 472-473 # 1 - 12 (ch. 8) Pages 518 - 519 # 1 - 9 (ch. 9)	
1	Thurs May 25	EQAO Sample Practice Questions	Handout	
3	Mon May 29	EQAO PREP PRACTICE TEST (2016)	Finish the questions that were not completed during class	
1	Wed May 31	EQAO PREP PRACTICE TEST (2015)	Finish the questions that were not completed during class	
3	Fri June 2	Take up any questions	Do more prep from EQAO web-site... get good sleep and have a healthy breakfast and lunch before testing next two classes.	
1 3	Tues June 6 Thurs June 8	**EQAO TESTING DURING YOUR MATH CLASS**	**Attendance is mandatory.** If you have a conflict, please see your teacher to make other arrangements A.S.A.P.	
1 3	Mon June 12 Wed. June 14	Exam Review	RETURN YOUR TEXTBOOK by June 8 – homework practice questions are on google classroom. Extra practice questions are available on Mrs. Behnke's web-site.	
	Tues. June 20	EXAM 8:30 - 10:00am		
	Wed. June 28	**Exam Review Day**	**Come in to review your marked exam if you'd like. Have a great summer ☺**	

**Note: For extra EQAO practice activities please check out EQAO's website under student resources:
http://www.eqao.com/en/assessments/grade-9-math/Pages/example-assessment-materials-2016.aspx
(Go to www.eqao.com → Select "Student" →Select "Grade 9 Math" →Select "Examples of Assessments and Scoring Materials" → Select "Student Assessment Booklets and Scoring Guides")

MPM1DI

Summative Assessment Review Day 1 (Units 1, 2 and 4 – Chapters 2 & 3)

☺ **Integers (Review work with integers!)**

☺ **Rational Number Operations**

- ◎ Convert mixed numbers to improper fractions
- ◎ To add or subtract find a common denominator then add or subtract the numerators, keep the denominator the same
- ◎ To multiply reduce if possible then multiply straight across on both the numerator and the denominator
- ◎ To divide multiply by the reciprocals.

Example 1. Simplify:

a) $\frac{-3}{5}+\left(\frac{-3}{4}\right)-\frac{7}{10}$

LCD 20

$= \frac{-3\times4}{5\times4} - \frac{3\times5}{4\times5} - \frac{7\times2}{10\times2}$

$= \frac{-12-15-14}{20}$

$= \frac{-41}{20}$

b) $\left(\frac{2}{3}-\frac{1}{3}\right)\div\left(\frac{-3}{4}-\frac{-2}{3}\right)$

$= \frac{1}{3} \div \left(\frac{-3\times3}{4\times3} + \frac{2\times4}{3\times4}\right)$

$= \frac{1}{3} \div \left(\frac{-9+8}{12}\right)$

$= \frac{1}{3} \div \left(\frac{-1}{12}\right)$

invert $\left(-\frac{1}{12}\right)$ and multiply.

$= \frac{1}{3} \times \frac{-12}{1}$

$= -4$

☺ **Exponent Laws (text 3.2, 3.3)**

◎ $a^m \times a^n = a^{m+n}$ To multiply powers with the same base, keep the base the same and add the exponents.

Example 2. a) $4^5 \bullet 4^3$

$= 4^{5+3}$

$= 4^8 = 65536$

b) $3^2 \bullet 3^5$

$= 3^{2+5}$

$= 3^7 = 2187$

◎ $\frac{a^m}{a^n} = a^{m-n}$ To divide powers with the same base, keep the base the same and subtract the exponents.

Example 3. a) $4^6 \div 4^3$

$= 4^{6-3}$

$= 4^3 = 64$

b) $4^{5x} \div 4^{3x}$

$= 4^{5x-3x}$

$= 4^{2x}$

◎ $(a^m)^n = a^{m\times n}$ Power of a power: Keep the base the same and multiply the exponents.

Example 4. $(2^5)^3$

$= 2^{5\times3}$

$= 2^{15}$

$= 32768$

Example 5. Simplify: a) $\frac{(m^5)(m^3)}{m^2}$

$= \frac{m^8}{m^2}$

$= m^6$

b) $x^{12} \div (x^2)^5$

$= x^{12} \div x^{10}$

$= x^2$

☺ **Algebra (text 3.4 – 3.7)**

◎ Adding and Subtracting Polynomials

- Can only add/subtract like terms (same variable with the same exponents)

  Example 6. $3x^2, 4x^2, -2x^2$ (LIKE terms)

  $3x, 3x^2, -3x^3$ (UNLIKE terms)

- Distributive Property

  $a(b + c) = ab + ac$

  Example 7. Expand and Simplify:

  a) $2(3x + 5)$ b) $\frac{1}{2}(6x + 8) - (2x - 3)$ c) $3x(2x^2 - 4x)$

  $= 6x+10$ $= 3x+4-2x+3$ $= 6x^3-12x^2$

  $= x+7$

☺ Also review chapter 2

Hypotheses, Sources of Data and Sampling Principles

Primary Data: original data that a researcher gathers for an experiment.

Secondary Data: Data that someone else has already gathered for another purpose (usually from publications like the internet or surveys).

Population: The entire group of people or items being studied.

Census: A survey of all members of a population.

Sample: Any group of people or items selected from a population.

Random Sample: A sample in which all members of a population have an equal chance of being chosen.

Simple Random Sample: Choosing a specific number of members randomly from the entire population.

Systematic Random Sampling: Choosing members of a population at fixed intervals from a population.

Stratified Random sampling: Dividing a population into distinct groups and then choosing a proportionate number randomly from each group.

Bias: Error resulting from choosing a sample that does not represent the entire population

Do:

Pages 98 # 1 - 4, 7 - 8 (ch. 2)

Pages 178-179 # 5, 11 - 19, 21 - 23 (ch 2, 3)

Redo old tests from units 1 and 2 and 4

MPM 1DI　　Integers and Fractions – Extra Practice　　Name: Solutions.

1. Evaluate.

a. $(-3)(8)$

$= -24$

b. $\frac{-30}{-6}$

$= 5$

c. $(-2)\times(-2)\times(-2)$

$= -8$

d. $(+3)+(-9)$

$= 3-9$

$= -6$

e. $\frac{(6)(-\cancel{15}^{3})}{-\cancel{5}_{1}} = 18$

f. $5+(-3)+7$

$= 5-3+7$

$= 12-3 = 9$

g. $(+8)+(+3)-(-6)+(-3)$

$= 8+3+6-3$

$= 17-3 = 14$

h. $(-5+3)-(8-12)$

$= -2-(-4)$

$= -2+4 = 2$

i. $(+3)-(-2)(-5)$

$= 3-(10)$

$= 3-10 = -7$

j. $(-12)\div(-2)+(-5)(+4)$

$= 6+(-20)$

$= 6-20$

$= -14$

k. $\frac{2(-5+3)-2(5-1)}{-7+4}$

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

$= \frac{-4-8}{-3} = \frac{-12}{-3} = 4$

l. $4[-6(-2-7)-5(7+2)]$

$= 4[-6(-9)-5(9)]$

$= 4(54-45)$

$= 4(9) = 36$

2. Use your knowledge of BEDMAS, fractions and integers to evaluate each expression. Write your answers in lowest terms.

a. $\frac{5}{9}-\frac{2}{9} = \frac{3}{9}$

$= \frac{1}{3}$

b. $\frac{4}{5}+\frac{7}{15} = \frac{12+7}{15}$

$= \frac{19}{15}$

c. $3\frac{1}{4}+2\frac{2}{3} = 3+2+\frac{3}{12}+\frac{8}{12}$

$= 5+\frac{11}{12} = 5\frac{11}{12}$

OR $\frac{71}{12}$.

d. $-\frac{3}{4}-\left(\frac{-2}{5}\right) = \frac{-3}{4}+\frac{2}{5}$

$= \frac{-15+8}{20}$

$= \frac{-7}{20}$

e. $\left(\frac{\cancel{50}^{2}}{-\cancel{9}_{1}}\right)\times\left(\frac{-\cancel{27}^{3}}{\cancel{25}_{1}}\right) = \frac{6}{1}$

$= 6$

f. $\left(\frac{5}{8}\right)\div\left(-\frac{3}{2}\right)$

$= \frac{5}{\cancel{8}_{4}}\times\left(-\frac{\cancel{2}}{3}\right)^{-1} = \frac{-5}{12}$

g. $\frac{7}{8}+\left(-\frac{1}{4}\right)\times\frac{5}{1}$

$= \frac{7}{8}-\frac{5}{4} = \frac{7-10}{8} = \frac{-3}{8}$

h. $\frac{-3}{5}\div\left(\frac{-5}{+12}\right)\div\left(\frac{-9}{10}\right)$

$= \frac{+\cancel{3}^{1}}{5}\times\frac{\cancel{12}^{4}}{\cancel{5}_{1}}\times\left(\frac{+\cancel{10}^{2}}{\cancel{9}_{\cancel{3}\,1}}\right)$

$= \frac{8}{5}$

i. $\left(-\frac{\cancel{3}}{5}\times\frac{2}{\cancel{3}}\right)+\frac{5}{6}\div\left(-\frac{5}{3}\right)$

$= -\frac{2}{5}+\frac{\cancel{5}^{1}}{\cancel{6}_{2}}\times-\frac{\cancel{3}^{1}}{\cancel{5}_{1}}$

$= -\frac{2}{5}-\frac{1}{2} = \frac{-4-5}{10} = \frac{-9}{10}$

SOLUTIONS:

1.	a. −24	b. 5	c. −8	d. −6	e. ~~30~~ 18	f. 9
	g. 14	h. 2	i. −7	j. −14	k. 4	l. 36
2.	a. $\frac{1}{3}$	b. $\frac{19}{15}$ *or* $1\frac{4}{15}$	c. $5\frac{11}{12}$ *or* $\frac{71}{12}$	d. $-\frac{7}{20}$	e. 6	f. $-\frac{5}{12}$
	g. $-\frac{3}{8}$	h. $1\frac{3}{5}$ *or* $\frac{8}{5}$	I $-\frac{9}{10}$			

☺ Relations (Chapter 2) continued

- Graphing a table of data to create scatter plots
- Line vs. Curve of best fit
- Linear vs. Non-linear relations linear → line of best fit non-linear → data does not fall in a line
- Interpolation vs. Extrapolation using line/curve of best fit to make a prediction

in between plotted points

outside plotted points

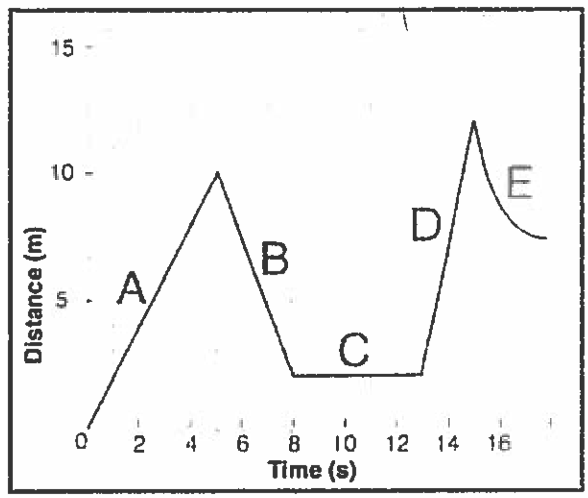
Ex. 1: Determine the sampling method used in each situation.

a) One thousand participants in a clinical trial were divided into groups based on their ages (ie. 20-24, 25-29, etc.). Then from these age groups, 20% of the participants were selected randomly to create a sample of 200 individuals. Stratified.

b) A random number generator was used to select an individual on a numbered list. From there, every 15th individual on the list was also chosen to be part of the sample. Systematic

Ex 2: Jeff's movements after he left his house are shown on this distance-time graph. Describe his movements (starting and stopping points and speed changes).

Jeff walks away from home for 5 s at 2 m/s then turns around and walks back toward home at $\frac{8}{3}$ m/s for 3 s. He stops for 5 s then walks away from home at 5 m/s for 2 s then turns around and sprints toward home for 3 s gradually slowing to a stop a little over 7 m from home.

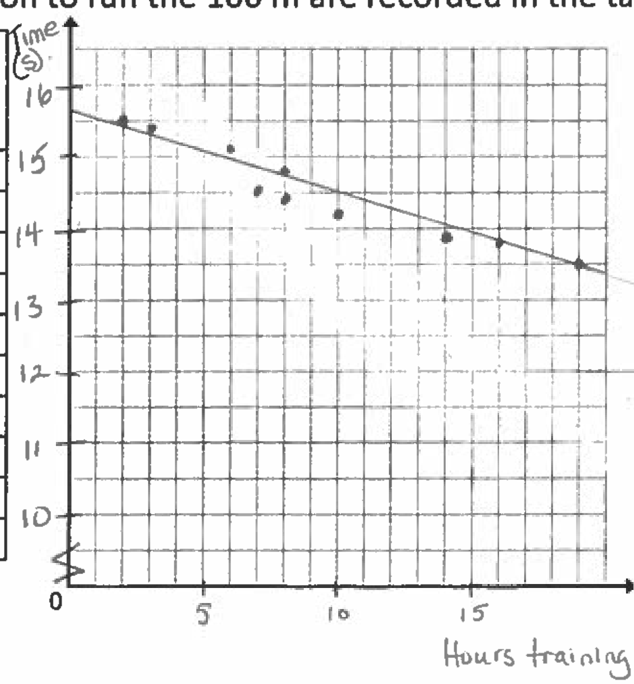


Independent Variable :
variable that affects another variable.
Always plotted on the x-axis.

Dependent Variable :
variable that is affected by some other variable (i.e. its value depends on another).
It is always plotted on the y-axis.

Ex. 3: The number of hours per week a person spends training to run 100 m and the time it took this person to run the 100 m are recorded in the table below.

Hours per week training	Time (sec) to run 100 m
10	14.2
3	15.4
6	15.1
8	14.8
16	13.8
8	14.4
7	14.5
2	15.5
19	13.5
14	13.9



a) Identify the independent variable. Hours per week training

b) Graph the data.

c) Draw a line or curve of best fit.

d) Predict the time it would take for a person who trains 12 hours per week to run 100m. Is this an example of interpolation or extrapolation?

about 14 hours

e) If a person ran the 100m in 12 seconds flat, about how many hours a week would they train? Is this an example of interpolation or extrapolation?

20 + 12
= 32 hours

Summative Assessment Review - Day 2 Chapters 4 & 5 (Units 3 & 5)

☺ **Unit 3 - Equations (chapter 4 in text)**

- **Ratios, rates and percent** — **Set up equations from word problems**
- **Solve equations (including equations with fractions)** — **Rearrange equations**

Example 1: Solve.

a) 3 : 5 = 80 : x

$\frac{3}{80} = \frac{5}{x}$

cross multiply

$3x = 80(5)$

$3x = 400$

$x = \frac{400}{3}$

b) $\frac{4}{x} = \frac{14}{35}$

$14x = 140$

$x = 10$

c) 18% of $90

0.18×90

$= \$16.20$

OR

$\frac{18}{100} = \frac{x}{90}$

$x = \frac{18}{100} \times 90$

$x = \$16.20$

d) In one gallon of paint, there are 3 red parts to 20 yellow parts. If a 5 gallon pail of paint is mixed, how many parts of each colour would need to be added to create the same colour tone?

red parts $3 \times 5 = 15$ parts

yellow parts $20 \times 5 = 100$ parts

e) The ratio of teachers to students in a school is 2 to 45. How many teachers are in the school if there is a total of 1410 students and teachers altogether in the school?

$\frac{\text{teachers}}{\text{total}} = \frac{2}{45+2}$ $\frac{t}{1410} = \frac{2}{47}$ $t = \frac{2 \times 1410}{47}$ $t = 60$ ∴ there are 60 teachers.

Example 2: Solve

a) $5x + 8 = 3x + 2$

$-3x \quad -3x$

$2x + 8 = 2$

$-8 \quad -8$

$2x = -6$

$\frac{2x}{2} = \frac{-6}{2}$

$x = -3$

b) $\frac{x}{6} + 4 = 3$

$-4 \quad -4$

$\frac{x}{6} = -1$

$\frac{x}{6} \times 6 = -1 \times 6$

$x = -6$

c) $3(2x - 4) = 9x + 3$

$6x - 12 = 9x + 3$

$-9x \quad -9x$

$-3x - 12 = 3$

$+12 \quad +12$

$-3x = 15$

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

Cross multiply

$5(x+2) = 2(x-1)$

$5x + 10 = 2x - 2$

$-2x \quad -2x$

$3x + 10 = -2$

$-10 \quad -10$

$3x = -12$

$\frac{3x}{3} = \frac{-12}{3}$

$x = -4$

e) $\frac{3k}{2} - \frac{k+3}{3} = \frac{8}{1} - \frac{k+2}{4}$

LCD 12

$\frac{12}{2}(3k) - \frac{12}{3}(k+3) = \frac{12}{1}(8) - \frac{12}{4}(k+2)$

$6(3k) - 4(k+3) = 12(8) - 3(k+2)$

$18k - 4k - 12 = 96 - 3k - 6$

$14k - 12 = -3k + 90$

$+3k \quad +3k$

$17k - 12 = 90$

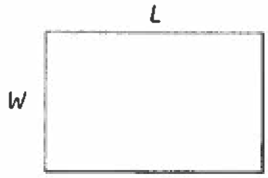
$+12 \quad +12$

$17k = 102$

$\frac{17k}{17} = \frac{102}{17}$

$k = 6$

Example 3: (Rearranging equations)
The formula for the perimeter of a rectangle is $P = 2L + 2W$, where L is the length and W is the width of the rectangle. Which is the formula for the length?



a. $\frac{2P - 2W}{2} = L$

b. $\frac{P - W}{2} = L$

c. $\frac{P - 2W}{2} = L$

d. $\frac{2P - W}{2} = L$

$P - 2W = 2L$

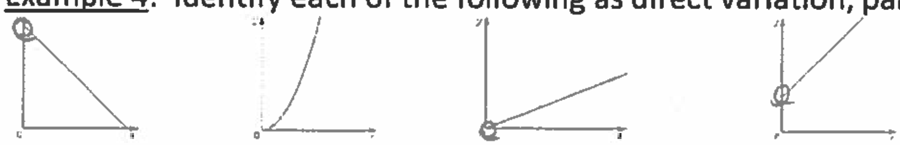
$\frac{P-2W}{2} = \frac{2L}{2}$

☺ **Modelling with Graphs (chapter 5 in text)**

- **Direct/Partial Variation** (both are linear)
  - ☺ **Direct Variation: y = mx initial value is 0**
  - ☺ **Partial Variation: y = mx + b initial value is NOT 0**
- **First Difference Tables**
- **Slope** ☺ **constant of variation**
  - ☺ **rate of change or unit rate**

☺ $m = \frac{rise}{run}$ ☺ $m = \frac{y_2 - y_1}{x_2 - x_1}$ ☺ $m = \frac{\Delta y}{\Delta x}$

Example 4: Identify each of the following as direct variation, partial variation or neither.



partial variation — neither (not linear) — direct variation — Partial Variation

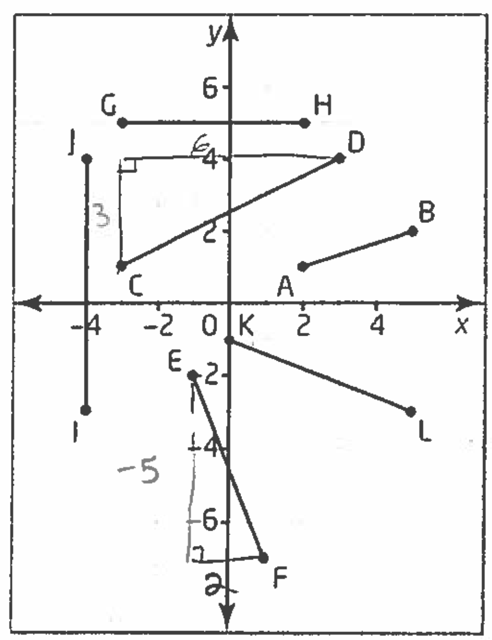
Example 5:
The table is for a linear relation. Unfortunately, one error was made in copying the table. Find the error and copy the table with the correction.

Δx	x	Y	Δy
	2	−5	
−3	−1	−2	3
−3	−4	0	2
−3	−7	4	4
−3	−10	7	3

x	Y	
2	−5	
−1	−2	3
−4	1	3
−7	4	3
−10	7	3

$m = \frac{\Delta y}{\Delta x}$
$= \frac{3}{-3}$
$= -1$

Example 6:
Examine the set of line segments.



a) Name the line segment that has the steepest negative slope. Express the slope in decimal form. EF

$m_{EF} = \frac{-5}{2}$
$= -2.5$

b) What is the slope of:

CD? $m_{CD} = \frac{1}{2}$

IJ? m_{IJ} is undefined

GH? $m_{GH} = 0$

Example 7:

What is the slope of the line segment joining the points P(0, 7) and B(−2, −4)?

$x_1 \; y_1 \qquad x_2 \; y_2$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{-4 - 7}{-2 - 0}$$

$$= \frac{-11}{-2} = \frac{11}{2}$$

Example 8:

The Pronghorn antelope is the fastest North American mammal. It can run 200 m in about 7.5 s. What is the average speed of this antelope? (speed is a rate of change – this is a slope and slope as a rate of change is the same as a unit rate.)

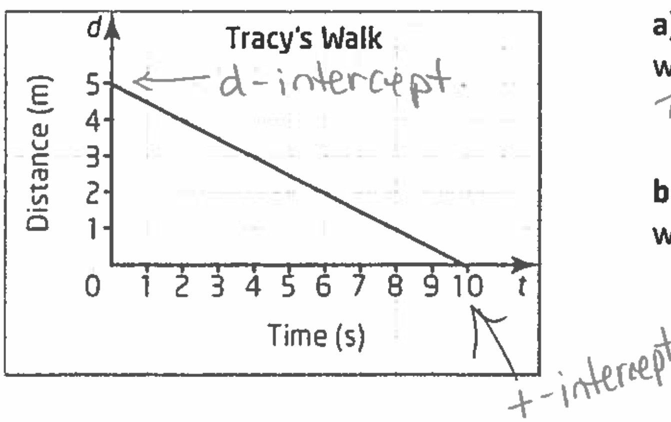
$$\text{average speed} = \frac{200 \text{ m}}{7.5 \text{ s}}$$

$$\cong 26.7 \; m/s$$

The average speed of the antelope is about 26.7 m/s.

Example 9:

The distance-time graph shows Tracy's motion in front of a motion sensor.



a) Identify the *d*-intercept and explain what it means.

Tracy begins 5m from the sensor.

b) Identify the *t*-intercept and explain what it means.

Tracy reaches the sensor after 10 seconds.

Do:

Page 356 # 1 – 6 (ch. 4),

Page 232 # 1 – 6 (ch. 4)

Pages 356-357 # 7 – 11 (ch. 5)

Pages 290 – 291 # 1 – 10 (ch. 5)

Re-do Unit 3 and 5 tests.

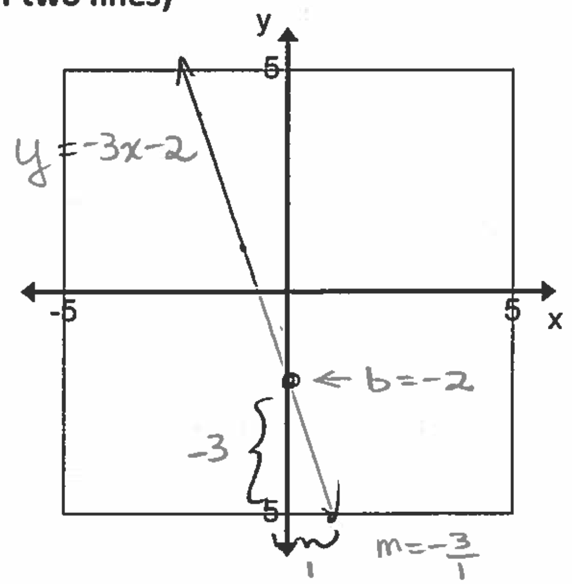
MPM1DI

Summative Assessment Review Day 3 (Unit 6 – Chapter 6)

☺ **Analyzing Linear Relations (chapter 6 in text)**

- **Equations of Lines in slope/y-intercept form**
  y = mx + b, where m is the slope, b is the y-intercept (where the graph crosses the y-axis – the point where x is 0)
- **Equations of Lines in standard form**
  Ax + By + C = 0, leading coefficient must be positive, no fractions, no decimals, = 0 on the right side, in order
- **Horizontal/Vertical Lines**
- **Graphing using intercepts**
- **Parallel Lines (parallel lines have the same slope)**
- **Perpendicular Lines (slopes are negative reciprocals)**
- **Finding Equation of Line given a point and slope**
- **Finding Equation of Line given two points**
- **Linear Systems (Finding point of intersection of two lines)**

Example 1: Graph the line y = -3x-2 using the slope and y-intercept.



Example 2: Write the equation 2x - 4y = 10 in slope/y-intercept form (y = mx + b form)

$2x - 4y = 10$
$-2x \qquad -2x$
$-4y = -2x + 10$
$\frac{-4y}{-4} = \frac{-2}{-4}x + \frac{10}{-4}$
$y = \frac{1}{2}x - \frac{5}{2}$

Example 3: Write y = -3x + 2 in standard form

$-y \qquad -y$
$-3x - y + 2 = 0 \rightarrow 3x + y - 2 = 0$

Example 4: The equations of four lines are given:

y = 2x - 4   y = 5   y = -x + 3   x = -3

Which of these represents

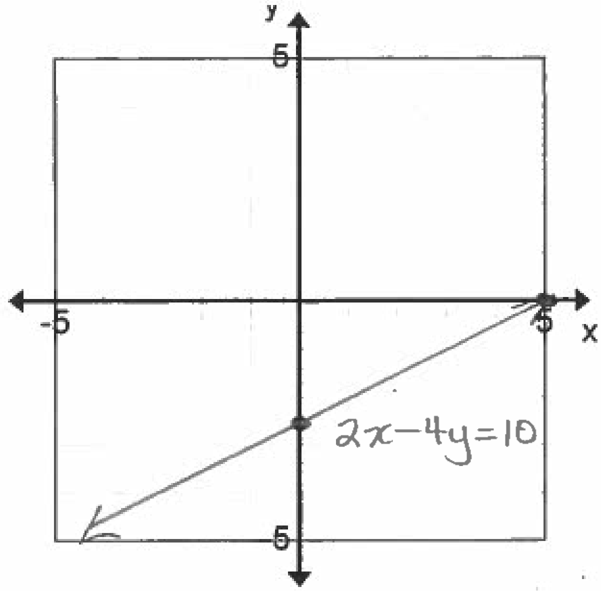
(a) a vertical line? cuts through x-axis, m undefined
$x = -3$

(b) a horizontal line? cuts through y-axis, $m = 0$
$y = 5$

(c) a line that slopes upward to the right?
$m > 0 \quad y = 2x - 4$

(d) a line that slopes downward to the right?
$m < 0 \quad y = -x + 3$

Example 5: Graph $2x - 4y = 10$ using intercepts.
To find the x-intercept, set $y=0$
To find the y-intercept, set $x = 0$
(May use "thumb-method")
Be sure to extend the line to fill your grid and label the line. Ensure that you have included a scale, you've labeled the axes and included arrows on the line and on the axes.



x-int
$2x=10$
$x=5$
$(5,0)$

y-int
$-4y=10$
$y=\frac{-5}{2}$
$(0,-2.5)$

Example 6: What is the equation of a line…

(a) With y-intercept 3 and perpendicular to a line with slope $\frac{1}{2}$. $m_{\perp}=-2$ $b=3$

$y=-2x+3$

(b) Parallel to the line $x = 2$ and passing through the point $(5, 7)$

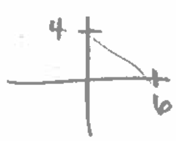
same form (undefined slope, vertical line) $x=5.$

(c) through $(-4, -1)$ with slope $\frac{1}{2}$.

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

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

(d) With an x-intercept of 6 and a y-intercept of 4
To write the equation of a line we need the slope and the y-intercept. We need to use the two points $(6, 0)$ and $(0, 4)$ to find the slope.



$m=\frac{-4}{6}$
$m=-\frac{2}{3}$
$b=4$

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

(e) Through the points (-1, 7) and (-5, 3) $(-5,3)\ (-1,7)$

To write the equation of a line we need the slope and the y-intercept. We need to use the two points to find the slope.

$$m=\frac{y_2-y_1}{x_2-x_1}$$
$$=\frac{7-3}{-1+5}$$
$$=\frac{4}{4}$$
$$=1$$

$$y=mx+b$$
$$7=1(-1)+b$$
$$8=b$$

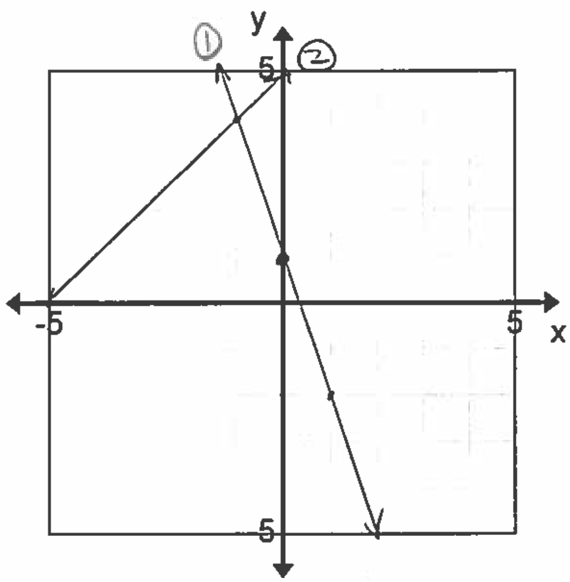
$$\therefore y=x+8$$

Example 7: Find the point of intersection of the two lines by graphing. **Check** your answer. Be sure to label your axes and use good graphing form

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

$y = x + 5$ ② $m=\frac{1}{1}$ $b=5$

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



Check in: $y = -3x + 1$

LS	RS
4	$-3(-1)+1$ $=3+1$ $=4$ ✓

Check in: $y = x + 5$

LS	RS
4	$-1+5$ $=4$ ✓

$\therefore (x,y)=(-1,4)$

Do :
Page 357 # 13 - 18 (ch. 6)
Page 355 # 6, 9, 12 (ch. 6)
Redo old Unit 6 Test.

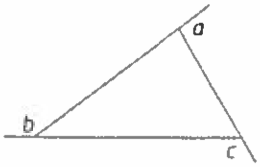
Summative Assessment Review Day 4 (Units 7, 8 & 9 - Chapters 7, 8 & 9)

☺ **Geometric Relationships (chapter 7 in text)**

- From grade 8 ... you must remember
  - ✓ How to classify triangles using side lengths
  - ✓ How to classify triangles using angle measures
  - ✓ When two lines intersect, the opposite angles are equal
  - ✓ The sum of the angles of a triangle is 180 °
  - ✓ When a transversal crosses parallel lines,
    - Alternate angles are equal (Z pattern)
    - Corresponding angles are equal (F pattern)
    - Co-interior angles have a sum of 180° (C pattern)
- Grade 8 review is on pages 362-363 of textbook.
- **Terminology** (all definitions are in text chapter seven – look for green highlighted words): Vertex, interior angle, exterior angle, ray, equiangular, adjacent, supplementary, complementary, transversal, congruent, convex polygon, concave polygon, pentagon, hexagon, heptagon, octagon, regular polygon, midpoint, median (the line segment joining a vertex of a triangle to the midpoint of the opposite side), bisect, right bisector, centroid (the point where the medians of a triangle intersect), similar
- The sum of the exterior angles of a convex polygon is 360 °.
  - ✓ RECALL: Convex polygon – all interior angles measure less than 180°

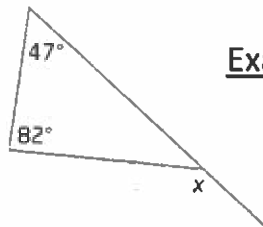
  See red box on page 370 for diagram of triangle, red box on page 380 for diagram of quadrilateral, 7.3 for convex polygons in general.
- The exterior angle at each vertex of a triangle is equal to the sum of the interior angles at the other two vertices. (E.A.T.) See red box on page 370 for diagram.
- The sum of the interior angles of a quadrilateral is 360 °
- For a polygon with n sides, the sum of the interior angles, in degrees, is S =
- A line segment joining the midpoints of two sides of a triangle is parallel to the third side and half as long.
- The height of a triangle formed by joining the midpoints of two sides of a triangle is half the height of the original triangle.
- The medians of a triangle bisect its area.
- Joining the midpoints of the sides of any quadrilateral produces a parallelogram
- The diagonals of a parallelogram bisect each other.
- The diagonals of a square are equal and they bisect each other at right angles.
- The diagonals of a rectangle bisect each other.
- The diagonals of a kite meet at right angles.
- The diagonals of a rhombus bisect each other at right angles.

Example 1: In the diagram, $a+b+c=$



a. 180°
(b.) 360°
c. 540°
d. None of these.

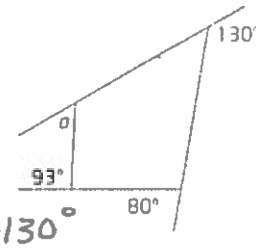
Example 2:
Find the measure of the exterior angle, *x*.



$x = 47° + 82°$

$x = 129°$ (EAT)

Example 3: Find the measure of the exterior angle, *a*.



$a = 360° - 93° - 80° - 130°$

$a = 57°$ (PEAST)

Example 4: A regular polygon has exterior angles equal to 30°. How many sides does the polygon have?

$30n = 360$

$n = 12$

∴ the polygon has 12 sides.

Example 5: A regular polygon has interior angles equal to 140°. How many sides does the polygon have? exterior angles measure 40° (Supp) OR (SA)

$40n = 360$

$n = 9$

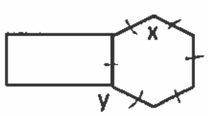
OR $180°(n-2) = 140°n$

$180°n - 140°n = 360°$

$40°n = 360°$ → $n = 9$

∴ the polygon has 9 sides.

Example 6:



Calculate the value of angle x and angle y, given that the hexagon is regular.

$180°(6-2) = 6x$

$\frac{180(4)}{6} = x$

$x = 120°$

$y = 360° - 120° - 90°$ ← assume rectangle

$y = 150°$

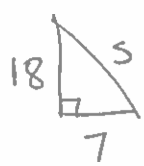
☺ Measurement Relationships (chapter 8 in text)

- Be able to use given formulas to find the area and perimeter of 2-D figures and the surface area, volume of 3-D figures.
- Be able to use the Pythagorean theorem as it relates to slant height, height, and radius in a cone $s^2 = h^2 + r^2$ and a pyramid $s^2 = h^2 + \left(\frac{1}{2}b\right)^2$.
- The volume of a prism is 3 times the area of a pyramid with the same dimensions.
- The volume of a cylinder is 3 times the area of a cone with the same dimensions.

Example 7: The volume of a cylinder is 300 cm^3. What is the volume of a cone with the same dimensions as the cylinder?

$$V_{cone} = \frac{1}{3}V_{cylinder}$$
$$= \frac{1}{3}(300)$$
$$= 100\text{cm}^3$$

Example 8 A cone has a radius 7cm and a height of 18 cm. What is its slant height?



$$s^2 = 18^2 + 7^2$$
$$s^2 = 373$$
$$s = \sqrt{373}$$
$$s \doteq 19.3 \text{ cm}$$

Example 9: A sphere has a diameter 12 cm. What is its volume, to the nearest cubic centimeter? $r = 6\text{cm}$

$$V = \frac{4\pi r^3}{3}$$
$$V = 4\pi(6)^3 \div 3$$
$$V = 288\pi$$
$$V \doteq 904.77868\ldots$$
$$V \doteq 905\text{cm}$$

☺ Optimizing Measurements (chapter 9 in text)

- 2D - Optimizing – determining dimensions that will maximize the area or minimize the perimeter
  - 4-sided rectangle – a SQUARE optimizes the area and perimeter
    - To determine dimensions,

      Given Perimeter:

      $W = \frac{P}{4}$

      $A = w^2$

      Given Area: $w = \sqrt{A}$

      $P = 4w$.
  - 3-sided rectangle (one side does not need fencing) – area and perimeter are optimized when l = 2w
    - To determine dimensions,

      Given Perimeter: 

      $w = \frac{P}{4}$

      $l = 2w$

      Given Area: 

      divide into 2 squares then take √ to find w.

      $w = \sqrt{(A \div 2)}$

      $l = 2w$
- 3D – Optimizing – determining dimensions that will maximize the volume or minimize the surface area The optimal is a sphere in 3-D so closest to a sphere optimizes.
  - Square-based Prism – a CUBE optimizes the volume and surface area
    - To determine dimensions,

      Given Volume: $V = x^3$

      So,

      $x = \sqrt[3]{V}$

      Given Surface Area: $A_{TOTAL} = A_{6\ squares}$

      $A = 6x^2$

      substitute in A, solve for x.
  - Cylinder – the volume and surface area are both optimized when h = 2r
    - To determine dimensions,

      Given Volume:

      $V = \pi r^2 h$ replace h with 2r

      $V = \pi r^2(2r)$

      $V = 2\pi r^3$

      substitute in V, solve for r ... get

      $r = \sqrt[3]{\frac{V}{2\pi}}$

      Given Surface Area:

      $A = 2\pi r^2 + 2\pi r h$ replace h with 2r

      $A = 2\pi r^2 + 2\pi r(2r)$

      $A = 6\pi r^2$

      substitute in A, solve for r. ... get

      $r = \sqrt{\frac{A}{6\pi}}$

Do :
Pages 520-521 # 1, 2, 4, 7 (ch. 7)
Pages 410 # 1 - 7, 9, 10 (ch. 7)
Page 520 # 8-15, 16a (ch. 8,9)
Pages 472-473 # 1 - 12 (ch. 8)
Pages 518 - 519 # 1 - 9 (ch. 9)
Redo old Unit 7, 8 & 9 Tests.