MFM 1PI

Southwood Secondary School
MATHEMATICS Practice Exam 2

UNITS 1,2: Integers, Graphing and Relations

1. Fill in the blanks.

a) The "Origin" has coordinates_____. b) The point (5,0) lies on the _____ axis.

2. Evaluate.

a) $(-6)+(-9)$ b) $\frac{44}{-11}$ c) $(+6)(-5)$ d) $(-7)^2$ e) $-2\sqrt{49}$

= _____ = _____ = _____ = _____ = _____

3. Evaluate. ***Show all BEDMAS steps.***

a) $-3+2-15-(-4)$ b) $30+16\div(-4)$ c) $-2(4)+3(-6)$

4. Evaluate the following for: $x=-2,\ y=3,\ z=-5$. ***Show your substitution and steps.***

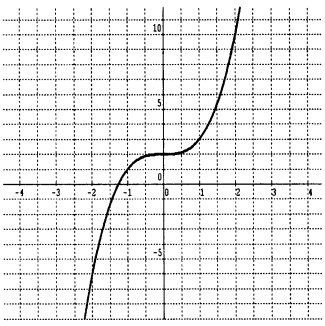
$2y+3z-4x^2$

5. State whether each is **linear or non–linear**.

a) $y=-4x-12$

_____

b)



_____

6. a) Complete the following tables. For **Finite Differences**.
b) State the type of relation. (**Linear or Non–linear)**

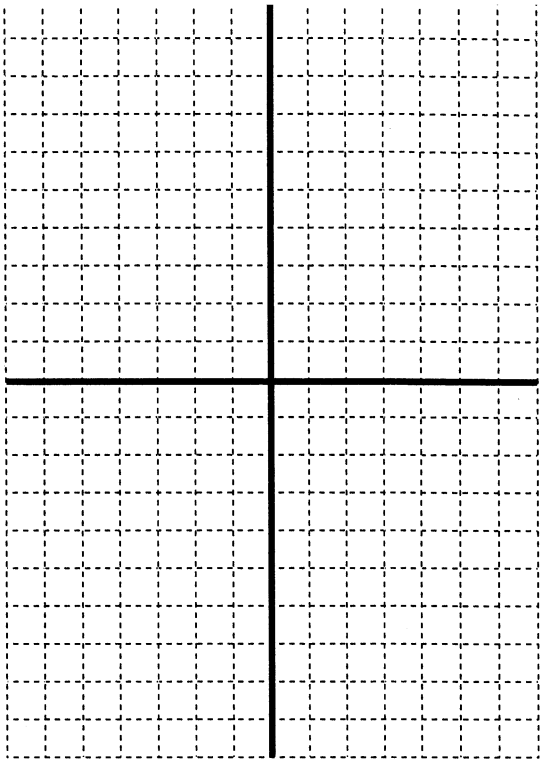
x	y	Difference in y–values
–1	10	
0	5	
1	2	
2	1	

Type of Relation: _____

7. i) Complete the table of values.
   SHOW ALL OF YOUR WORK.
   ii) Graph on the grid provided.
   Label the grid fully.

$y = x^2 - 4$

x	y
2	
0	
–2	



UNIT 3: Algebra and Equations

1. Simplify.

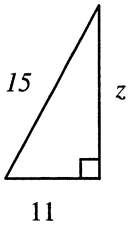
   a) $6x - 3 + 5x - 4$ b) $-4(3z - 4)$ c) $-(7 - 6a)$

2. Solve. ***Show all steps***

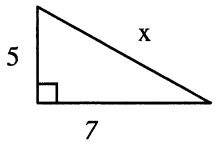
a) $3x + 1 = -5$ b) $2x - 1 = 6x + 7$ c) $2(x - 1) = -4x + 6 + 14x$

3. Use the Pythagorean Theorem to determine the **length** of each unknown side.
   Round to 1 decimal place if necessary.

a)



b)



UNIT 4: Rational Numbers

1. Fill in the blanks.

a) Reduce to lowest terms. $\frac{36}{30} =$ _____ b) Write as a improper fraction $-2\frac{3}{8} =$ _____

2. Evaluate. ***Leave your answer as a fractions in lowest terms.***

a) $-\frac{2}{3}-1\frac{1}{6}$ b) $\left(\frac{-3}{2}\right)^2$ c) $1\frac{3}{4}\div 2\frac{4}{5}$

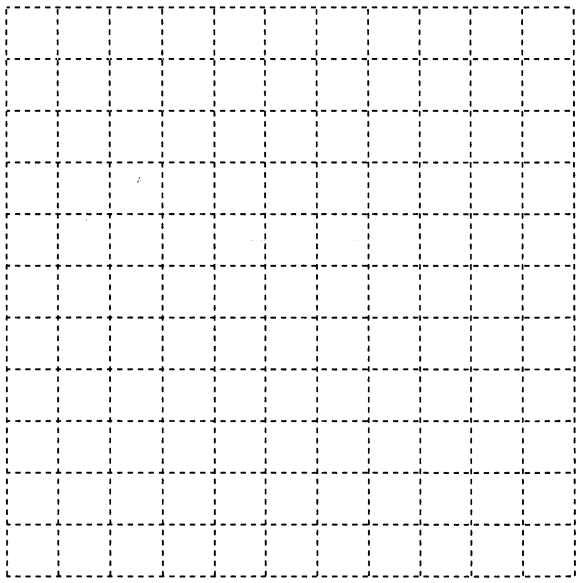
UNIT 5: Slope and Applications

1. To place an add in the newspaper it will cost \$10 plus a charge of \$15 per day.

a) Complete the table of values.

Number of Days	Cost ($)
0	
1	
2	
3	
4	

b) Draw and properly label the graph.



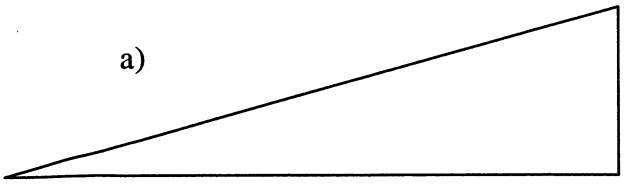
c) State the slope of the line with units. _____

d) State the y–intercept with units. _____

e) What type of variation is this? _____

2. Find the slope of each of the following. ***State the formula used.***

a)



b) $(-8,-1)$ and $(-2,11)$

UNIT 6: Geometry

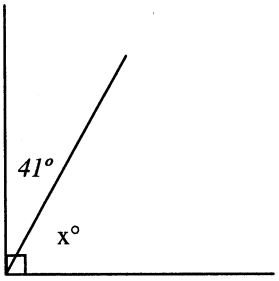
1. Fill in the blanks.

a) What is true about the alternate angles ("Z" Pattern) of parallel lines?_____.

b) The sum of the angles in a quadrilateral is _____.

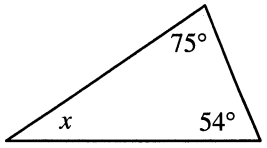
2. Determine the value of the unknown(s) in each diagram.

a)



$x =$ _____

b)

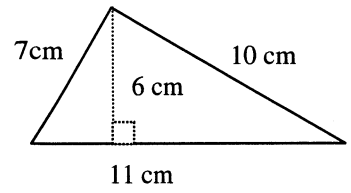


$x =$ _____

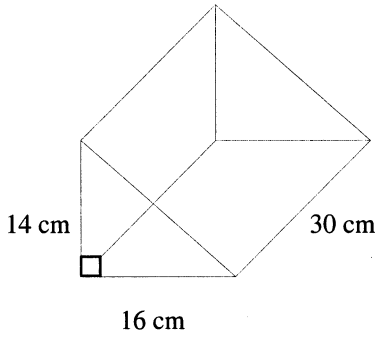
UNIT 7: Measurement

State any formula used. Round all answers to 1 decimal place. Use your π button or 3.14159
Include the correct units in your answer.

1. Determine the **area** and **perimeter.**



2. Determine the **volume.**



UNIT 8: Ratios and Proportions and other stuff

Show full solutions as done in class

1. The ratio of dimes to quarters in a jar is 12:5
   How many quarters are there if there are 48 dimes in the jar?

2. I can drive 54.3 km in 45 minutes. How far can I drive in 77 minutes?

3. State the unit rate. Circle the better buy.

   A: $3.29 for 4 peaches

   Unit rate = _____

   B: $9.99 for 12 peaches

   Unit rate = _____

4. A store has a $1500 computer on sale for 40% off.

a) Calculate the discount.

b) Calculate the sale price.

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MATHEMATICS Practice Exam 2

UNIT 1,2: Integers, Graphing and Relations

1. Fill in the blanks.

a) The "Origin" has coordinates (0,0). b) The point (5,0) lies on the X axis.

2. Evaluate.

a) $(-6)+(-9)$ = -15

b) $\frac{44}{-11}$ = -4

c) $(+6)(-5)$ = -30

d) $(-7)^2$ = 49

e) $-2\sqrt{49}$ = $-2(7)$ = -14

3. Evaluate. Show all steps.

a) $-3+2-15-(-4)$

$= -3+2-15+4$

$= -18+6 = -12$

b) $30+16\div(-4)$

$= 30-4$

$= 26$

c) $-2(4)+3(-6)$

$= -8-18$

$= -26$

4. Evaluate the following for: $x=-2,\ y=3,\ z=-5,\ 2y+3z-4x^2$

$2(3)+3(-5)-4(-2)^2$

$= 6-15-4(+4)$

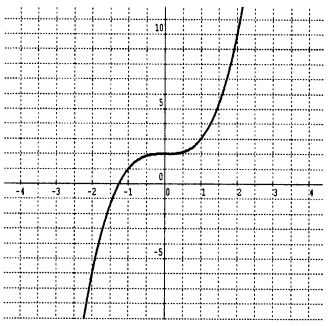
$= 6-15-16 = 6-31 = -25$

5. State whether each is **linear or non-linear**.

a) $y=-4x-12$

linear

b)



Non-linear

6. a) Complete the following tables. For **Finite Differences**.
b) State the type of relation. (**Linear or Non-linear**)

x	y	Difference in y-values
–1	10	
0	5	5
1	2	3
2	1	1

Type of Relation: Non-linear

7. i) Complete the table of values.
   SHOW ALL OF YOUR WORK.
   ii) Graph on the grid provided.
   Label your graph fully.

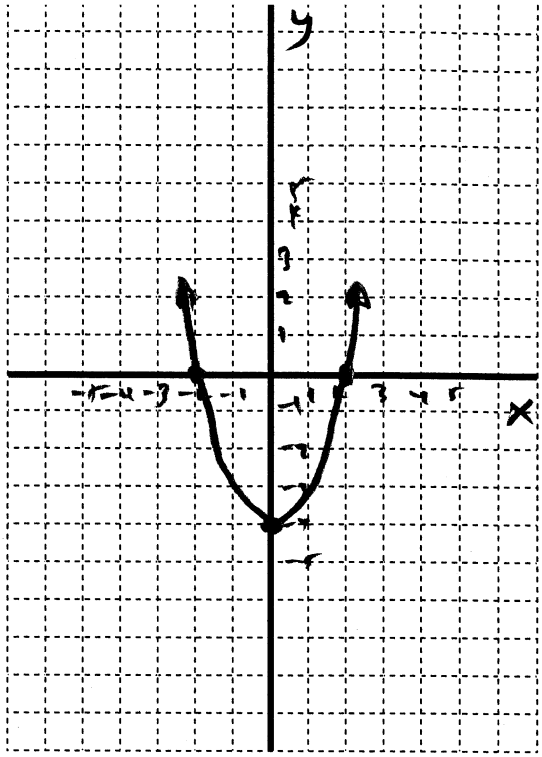
$y = x^2 - 4$

x	y
2	0
0	−4
−2	0

$y = (2)^2 - 4 = 0$

$y = (0)^2 - 4 = -4$

$y = (-2)^2 - 4 = 0$



UNIT 3: Algebra and Equations

1. Simplify.

a) $6x - 3 + 5x - 4$

$11x - 7$

b) $-4(3z - 4)$

$-12z + 16$

c) $-(7 - 6a)$

$-7 + 6a$

2. Solve. *Show all steps*

a) $3x + 1 = -5$

$3x + 1 - 1 = -5 - 1$

$\frac{3x}{3} = \frac{-6}{3}$

$x = -2$

b) $2x - 1 = 6x + 7$

$2x - 1 - 6x = 6x + 7 - 6x$

$-4x - 1 = 7$

$-4x - 1 + 1 = 7 + 1$

$\frac{-4x}{-4} = \frac{8}{-4}$

$x = -2$

c) $2(x - 1) = -4x + 6 + 14x$

$2x - 2 = 10x + 6$

$2x - 2 - 10x = 10x + 6 - 10x$

$-8x - 2 = 6$

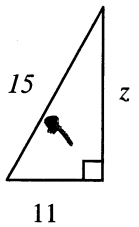
$-8x - 2 + 2 = 6 + 2$

$\frac{-8x}{-8} = \frac{8}{-8}$

$x = -1$

3. Use the Pythagorean Theorem to determine the **length** of each unknown side. Round to 1 decimal place if necessary.

a)



$h^2 = a^2 + b^2$

$15^2 = 11^2 + z^2$

$225 = 121 + z^2$

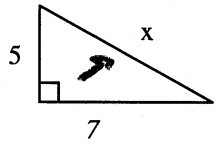
$225 - 121 = 121 + z^2 - 121$

$104 = z^2$

$\sqrt{104} = z$

$10.2 = z$

b)



$h^2 = a^2 + b^2$

$x^2 = 5^2 + 7^2$

$x^2 = 74$

$x = \sqrt{74}$

$x = 8.6$

UNIT 4: Rational Numbers

1. Fill in the blanks.

a) Reduce to lowest terms. $\frac{36}{30} \overset{\div 6}{=} \frac{6}{5}$ b) Write as a improper fraction $-2\frac{3}{8} = \frac{-19}{8}$

2. Evaluate. ***Leave your answer as a fraction. (No decimals!)***

a) $-\frac{2}{3} - 1\frac{1}{6}$

$= \frac{-2}{3} \overset{\times 6}{} - \frac{7}{6} \overset{\times 3}{}$

$= \frac{-12}{18} - \frac{21}{18}$

$= \frac{-33}{18} \overset{\div 3}{} = \frac{-11}{6}$

b) $\left(\frac{-3}{2}\right)^2$

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

$= \frac{9}{4}$

c) $1\frac{3}{4} \div 2\frac{4}{5}$

$= \frac{7}{4} \div \frac{14}{5}$

$= \frac{7}{4} \times \frac{5}{14}$

$= \frac{35}{56} \overset{\div 7}{} = \frac{5}{8}$

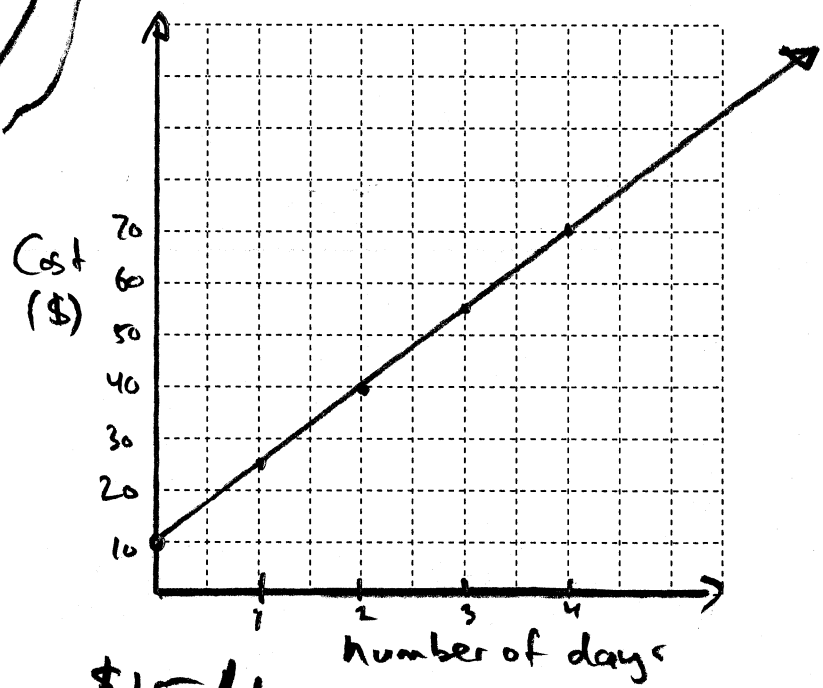
UNIT 5: Slope and Applications

1. To place an add in the newspaper it will cost $10 plus a charge of $15 per day.

a) Complete the table of values.

Number of Days	Cost ($)
0	10
1	25
2	40
3	55
4	70

b) Draw and properly label the graph.



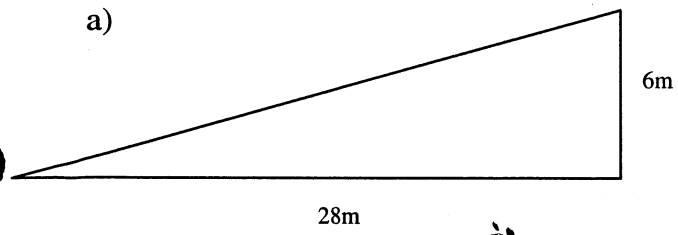
c) State the slope of the line with units. $15/day

d) State the y-intercept with units. $10

e) What type of variation is this? PARTIAL

2. Find the slope of each of the following:

a)



$\text{Slope} = \frac{\text{rise}}{\text{run}} = \frac{6}{28} = \frac{3}{14}$

b) $(-8,-1)$ and $(-2,11)$

$x_1\ y_1 \qquad x_2\ y_2$

$\text{Slope} = \frac{\Delta y}{\Delta x}$

$= \frac{(-1)-(11)}{(-8)-(-2)}$

$= \frac{-12}{-6} = 2$

UNIT 6: Geometry

1. Fill in the blanks.

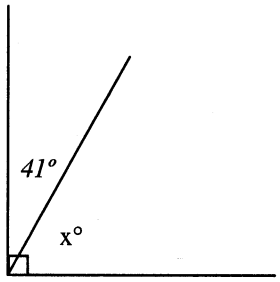
a) What is true about the alternate angles ("Z" Pattern) of parallel lines? they are the equal

b) The sum of the angles in a quadrilateral is 360°.

4 sides

2. Determine the value of the unknown(s) in each diagram.

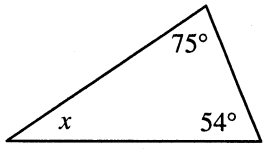
a)



$x = 49°$

$90° - 41°$

b)



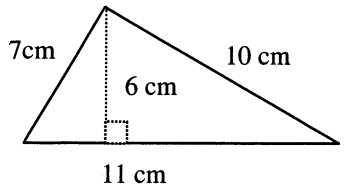
$x = 51°$

$180° - 54° - 75°$

UNIT 7: Measurement

State any formula used. Round all answers to 1 decimal place. Use your π button or 3.14159
Include the correct units in your answer.

1. Determine the **area** and **perimeter.**

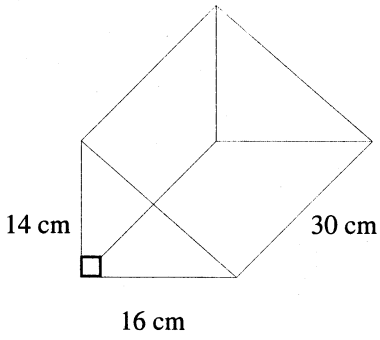


$A = \frac{bh}{2}$ $\qquad P = 7 + 11 + 10$

$A = \frac{(11)(6)}{2}$ $\qquad P = 28\text{ cm}$

$A = 33\text{ cm}^2$

2. Determine the **volume.**



$V = \frac{bh}{2}H$

$V = \frac{(16)(14)}{2}(30)$

$V = 3360\text{ cm}^3$

UNIT 8: Ratios and Proportions and other stuff

1. The ratio of dimes to quarters in a jar is 12:5
   How many quarters are there if there are 48 dimes in the jar?

dimes : quarters = dimes : quarters

$12 : 5 = 48 : x$

$\frac{12}{5} = \frac{48}{x}$

$(48)\frac{5}{12} = \frac{x}{48}(48)$

$x = 20$ → ∴ there are 20 quarters

2. I can drive 54.3 km in 45 minutes. How far can I drive in 77 minutes?

Km : min = Km : min

$54.3 : 45 = x : 77$

$(77)\frac{54.3}{45} = \frac{x}{77}(77)$

$x = 92.9$

∴ I can drive 92.9 km

3. State the unit rate. Circle the better buy.

A: $3.29 for 4 peaches

Unit rate = 0.82 $/peach

B: $9.99 for 12 peaches

Unit rate = 0.83 $/peach

4. A store has a $1500 computer on sale for 40% off.

a) Calculate the discount.

40% of $1500

↓ ÷100 ↓

0.40 × $1500

= $600

∴ discount is $600

b) Calculate the sale price.

$1500 - $600 = $900

∴ the sale price is $900