9 ACADEMIC MATHEMATICS
MOCK FINAL EXAMINATION

Total: _____/59

Knowledge and Understanding [24 marks]

Part A Short Answer Questions – one mark each. [10 marks] Write your answer in the space provided.

1. Express $(5^4)(5^2)$ as a single power. _____

2. Simplify $\frac{x^4}{x^{-3}}$ _____

3. Evaluate $\left(\frac{3}{4}\right)^3$. Your answer should be in fractional form. _____

4. Evaluate $\left[\left(\frac{1}{2}\right)^2 - \left(\frac{1}{4}\right)^4\right]^0$ _____

5. Evaluate for k = 3, h = 2. _____
   $5(k - h)^3 + k^2$

6. Write the rate of discount to one decimal place on a purchase of $180 if the discount is $30. Express that rate as a percent. _____

7. The volume of a rectangular prism with dimensions of 5 cm, 6 cm, and 8 cm is: _____

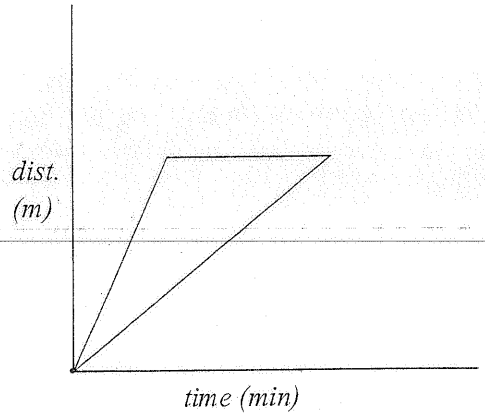
8. The surface area of a cone with dimensions of h = 8 cm, R = 6 cm is: _____
   If that cone had a volume of 80 cm^3, and a height of 8 cm, what would the radius be? _____

9. Calculate the x-intercept of $2x + 3y - 6 = 0$ _____

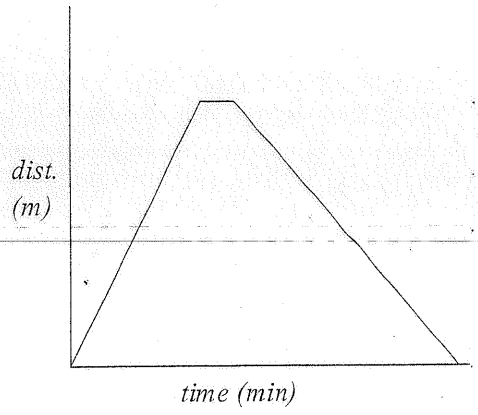
10. Which graph shows someone walking to a mailbox then home again?

_____

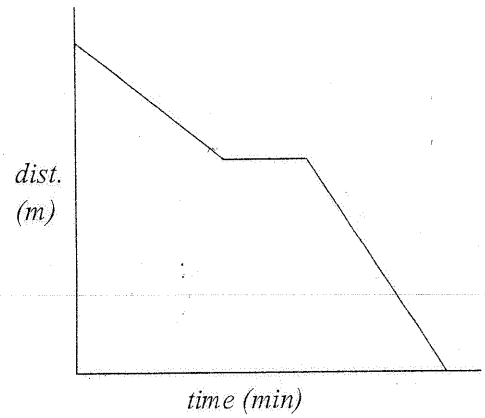
a.



b.



c.



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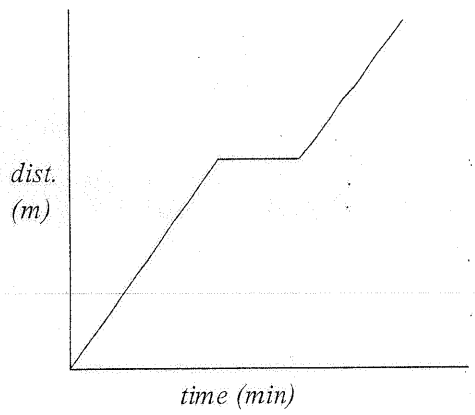


Part B: Show all of your work for full marks. [14 marks]

1. Simplify (and evaluate where appropriate): [6 marks]

a) $(5x - y) - (3x - 2y)$

b) $\frac{12x^6 - 8x^4}{4x^2}$

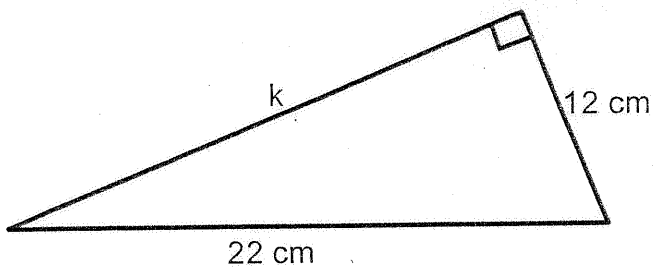
c) $\sqrt{-3^2 + (-5)^2}$

2. [3 marks]

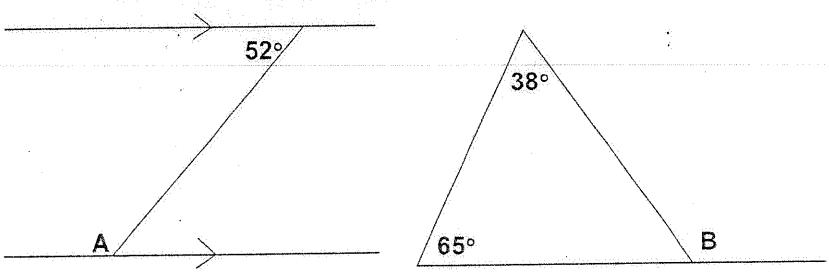
a) Find the equation of the line which is perpendicular to : $y = \frac{2}{3}x + 4$ and passes through (-3, 2)

b) Write the equation of a straight line going through the points (1, -2) and (3, 4).

3. Determine the length of the unknown side to 1 decimal place: [2 marks]



4. Determine the missing angles:

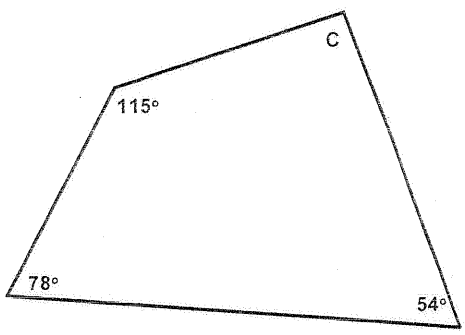


A = _____

B = _____

C = _____

[3 marks]



Application: **[35 marks]**

1. Expand and simplify: $8(2x - 3) - 4x(6 - 5x)$ [2 marks]

2. Simplify **completely** and **then** evaluate when x = -1 and y = 2 [4 marks]

$$\frac{(4x^2)(3x^3y^4)}{(2xy^2)^3}$$

3. Write the following equation in slope-intercept Form: [3 marks]

$2x + 3y = 9$

4. Solve the following equation: [3 marks]

$5 - (3x - 2) = 6 - 2(2x + 1)$

5. If the perimeter of a rectangle is 46 cm and its width is 6 cm, what is its **area**? (Include a diagram and show all your calculations.) [3 marks]

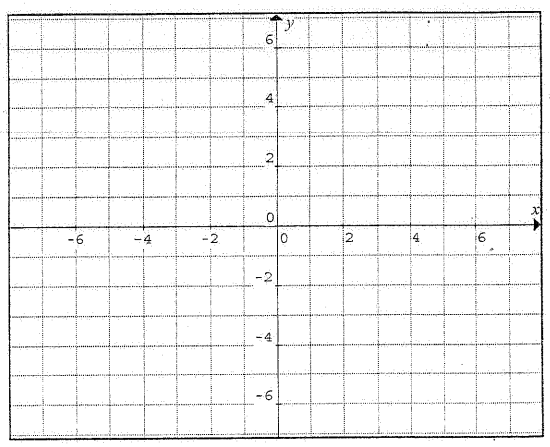
6. If (3, -1) is on the line x + 2y + k = 0 then the value of k is:

[2 marks]

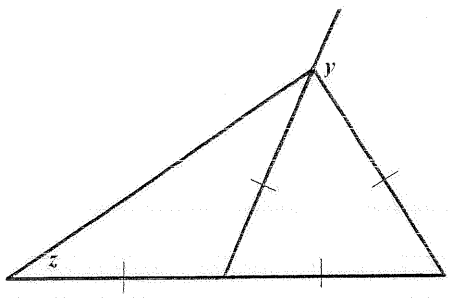
7. Determine the point of intersection by graphing. Clearly state the coordinates of your point of intersection. [5 marks]

$x - 2y = 5$

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



8. Determine the value of the angles indicated. [2 marks]
Provide reasoning for your answers.



y=_____

z=_____

9. A veterinarian wishes to use puppy paw sizes to determine the height of an adult dog. The vet measures puppy paws at 8 weeks of age and then measures the dog's height at one year of age.

Width of Puppy Paw (cm)	3.2	2.6	4.5	3.0	2.0	2.3	2.1	1.5	1.2	2.4
Height of Adult Dog (cm)	18.5	14.6	24.9	17.4	13.9	14.0	12.4	9.1	8.0	14.3

a) Make a scatter plot of the data in the table on the grid below. [2 marks]

b) Draw a line of best fit for the data. [1 mark]

c) If a puppy has a paw size of 4.0 cm, how tall of an adult should it be?

[1 mark]

d) Determine algebraically the equation for your line of best fit. [4 marks]

e) Using your equation from part (d), verify your answer to part (c). Justify your result. [3 marks]