

Hillcrest High School

Mathematics

May 2013

Grade 9

Examiner: Mr S Griffiths

Moderator: Mrs Cole

Instructions to candidates:

This paper consists of 5 pages.

Answer all questions on the paper provided.

Answer Question 7 and 8 on the graphs provided.

You may not share calculators with anyone during the exam.

Round all answers off correctly to 2 decimal places unless otherwise stated.

Write your teachers name on the top of your answer paper.

Number your answers correctly according to the numbers used in this question paper.

Show all working out.

Draw double margins.

It is in your best interest to set your work out neatly and legibly.

Total: 120 marks

Question 1

Simplify the following algebraic expressions

- a) $4a(a + 5)$ (2)
- b) $(3c + 4)(4c - 3)$ (2)
- c) $(5 - 3z)(z + 2)$ (2)
- d) $(x - 5)^2$ (2)
- e) $4x(2x - 2) - 3x(x + 4)^2$ (4)

[12]

Question 2Each of the following statements has parts that are missing. Rewrite each statement so that each one is true.

- a) $(x \text{ ______})(x + 7) = x^2 + 14x + 49$ (1)
- b) $2x^2y - \text{ ______} = 2xy(\text{ ______} - 2y)$ (2)
- c) $x^2 - \text{ ______} - \text{ ______} = (x + 5)(\text{ ______} - 7)$ (3)

[6]

Question 3

Factorise the following fully.

- a) $7a^3 - 21a$ (2)
- b) $r^4t^2 - 9q^2$ (2)
- c) $\frac{9}{16a^2} - \frac{1}{9c^4}$ (2)
- d) $x^2 + 11x + 18$ (2)
- e) $2x^2 - 14x - 16$ (3)
- f) $2x^5 - 162x$ (3)
- g) Andrew has a piece of string that is $(x^2 + 13x + 40)$ cm long. How many pieces that are each $(x + 5)$ cm long can he cut it into? (2)

[16]

Question 4

Simplify the following (HINT: factorise first.....)

a) $\frac{2x + 4}{2}$ (2)

b) $\frac{3x^3y^2z - 15x^4y^3z}{3x^3y^3z^2}$ (4)

c) $\frac{4x^3 + 8x^2}{x + 2}$ (2)

[8]

Question 5

Solve for the variable in the following equations:

a) $5x + 10x = 15$ (2)

b) $7a - 12 = 9a + 5$ (3)

c) $8(x + 1) + 2 = 2x - 2$ (2)

d) $\frac{x}{3} + \frac{2}{4} = \frac{1}{2} + 2x + \frac{7}{6}$ (4)

e) 5 is added to a number and the total is doubled. Find the number if the answer is 24. (2)

f) The perimeter of a rectangle is 44cm, and the length is 6cm longer than the breadth,

1) If the breadth is x cm, give the length of the rectangle in terms of x (1)

2) Devise an equation to calculate the value of x (2)

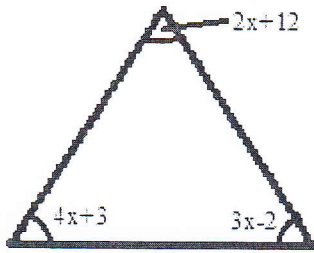
3) Calculate the length and breadth of the rectangle (3)

[19]

Question 6

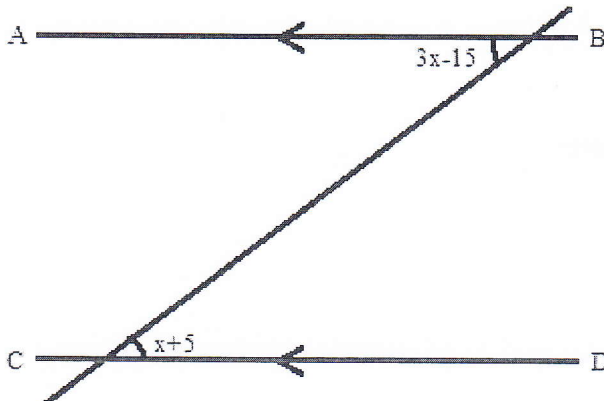
Calculate the value of x . give reasons for your methods.

a)



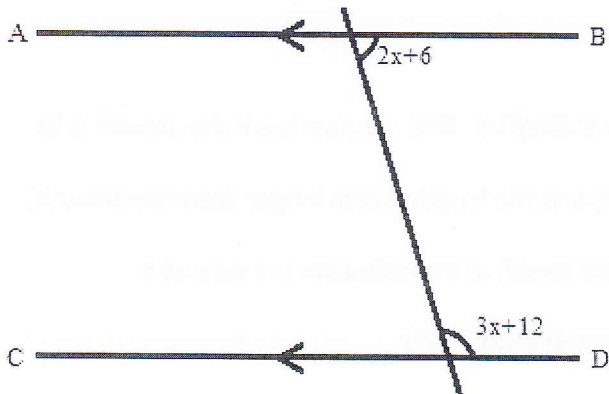
(4)

b)



(4)

c)



(4)

[12]

Question 7

Alwande buys sweets from the shop. The table shows what she pays for various different weights of sweets. Answer this question on the graph paper provided.

Mass of sweets(kg)	1	2	B	4	5
Cost of sweets(Rand)	5	A	15	20	C

- a) Calculate the missing values A,B and C (3)
 - b) **On the Graph paper provided**, plot the information in the table (5)
 - c) Reading from the graph, what will the cost be for $4\frac{1}{2}$ kg of sweets? (2)
 - d) Reading from the graph, how many kg of sweets can she buy for R12.50? (2)
- [12]

Question 8

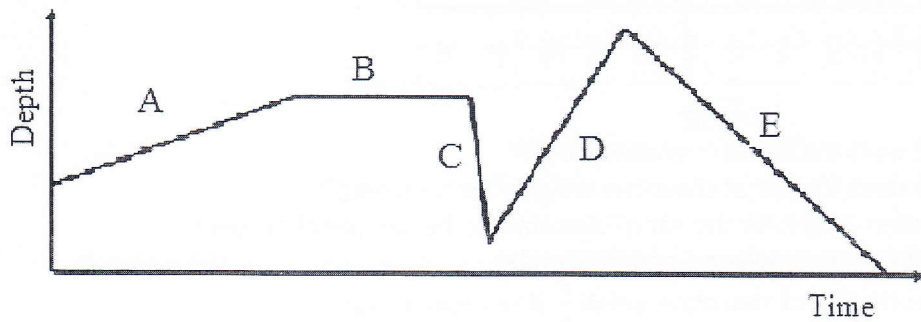
Study the following table and answer the questions that follow. **Answer this question on the graph paper provided.**

Speed (km/h)	40	60	80	120	160
Time (hours)	12	8	6	4	3

- a) Is this table in direct proportion or inverse proportion? Give a reason for your answer. (2)
 - b) **On the Graph paper provided**, plot the information in the table (5)
 - c) Reading from the graph, how long will it take whilst travelling at 90 km/h? (2)
 - d) Reading from the graph, what speed would complete this journey in 10 hours? (2)
 - e) What information does the constant product of this graph give us? (1)
- [12]

Question 9

A test tube containing a chemical liquid is used in an experiment. During the experiment the depth of the liquid changes with time. Match the different parts of the graph to the statements below. Write only the letter and the number of your answer.

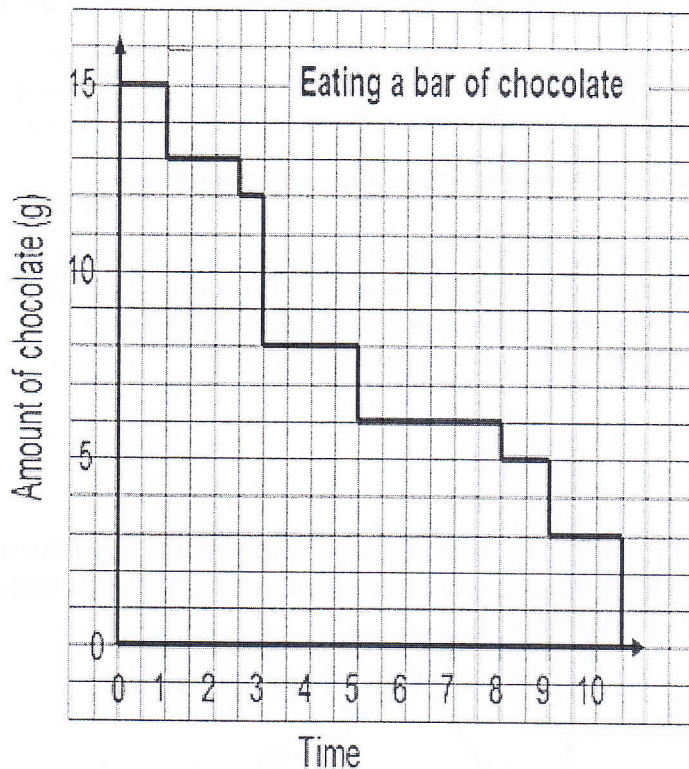


- 1 Some liquid is poured out quickly
- 2 The test tube is emptied
- 3 Liquid is added slowly to the test tube
- 4 Some liquid is poured in quite quickly
- 5 The level of the liquid remains constant

[5]

Question 10

Answer the questions about the following graph.



- a) How much does the bar of chocolate weigh? (1)
 - b) How much does the bar of chocolate weigh after 5 seconds? (1)
 - c) How long does it take for the bar of chocolate to be completely eaten? (1)
 - d) What is happening between 5 and 8 seconds? (1)
 - e) When does the bar of chocolate weigh $\frac{1}{3}$ of its original mass? (1)
- [5]

Question 11

- a) Write $2y - 6x - 12 = 0$ in the form $y = mx + c$ (2)
 - b) Write down 3 ordered pairs that contain solutions for the equation $y = -3x + 2$ (3)
 - c) Draw axes showing numbers from -6 to 6 on both axes. On your axes draw the line that represents the solutions of the equation $y = -3x + 2$ (5)
 - d) The ordered pair $(\frac{1}{2}; y)$ is a solution to the equation $y = -3x + 2$. Calculate the value of y . (2)
 - e) Is $(4; -10)$ an ordered pair for the function $y = -3x + 2$? (1)
- [13]

Total:120 marks