Hillcrest High School

Grade 9 Mathematics **November 2010**

Time : 2 Hours **Marks : 125**

Instructions

1. This paper consists of **7** pages and a formula sheet.
1. Answer ALL the questions on the paper provided.
2. You may use your OWN calculator.
3. Round off all answers to 2 decimal places.
4. Number your answers correctly according to the numbers used in the question paper.
5. Write neatly and legibly.

Question 1

Factorise the following expressions:

1.1) $2x + 2y$ (1)

1.2) $9p^2 - 4q^2$ (2)

1.3) $a(x + y) - b(x + y)$ (2)

1.4) $\frac{12g^2}{4} + \frac{8g^5}{4}$ (2)

1.5) $3x^2 - 12$ (3)

[10]

Question 2

Solve for x:

2.1) $4x - 9 = x$ (1)

2.2) $2(2x - 4) = 4(4 - 2x) - 36$ (2)

2.3) $-(a - 3) + 2a = -3a + 5$ (3)

2.4) $\frac{x-2}{2} + \frac{x}{8} = 4$ (4)

2.5) Add 3 to a number then double the result. If the total is 22 find the number. (3)

[13]

Question 3

If a = -3 and b = 2, find the values of :

3.1) a^2b (1)

3.2) 3a + 2b (2)

3.3) $\frac{a}{4} + \frac{b}{3}$ (2)

3.4) $\frac{2a}{3} + \frac{3b}{5}$ (3)

[8]

Question 4

Simplify the following:

4.1) $x^2 x\ x^8$ (1)

4.2) $2^2 \times 2^3$ (1)

4.3) $3x^3 \times 6x^2$ (2)

4.4) $(-2)^2.(-3)^3$ (3)

4.5) $5^3 x\ 5^0$ (2)

4.6) $\frac{4x^5}{2x^2}\frac{y^3}{y}$ (3)

[12]

Question 5

Write each of the following in scientific notation:

5.1) 63 529 (2)

5.2) 0,00625 (2)

5.3) 16 000 000 (2)

[6]

Question 6

-7 ; π ; 0,66 ; 0,375 ; $\sqrt{13}$; $\frac{37}{99}$; 2

6.1.1 Write down the rational numbers from the list above. (5)

6.1.2 Write down the natural numbers from the list above. (1)

6.2 Complete the table for the pattern of stop signs. (4)

Figure 1

Figure 2

Figure number	1	2	3	4	(6.2.3)	(6.2.4)
Number of sides	8	15	(6.2.1)	(6.2.2)	71	106

6.3 Find the rule for each of the following sequences:

6.3.1 0; 4; 8; 12; 16; ..... (1)

6.3.2 2; 6; 10; 14; ..... (2)

[12]

Question 7

7.1.1 Complete the table for the function f(x) = -3x + 4 (2)

x	-2	-1	0	1	2
y = -½x + 4					

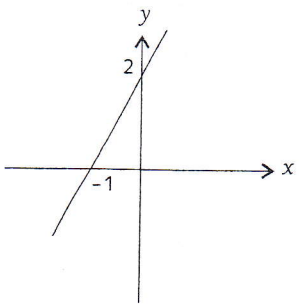
7.1.2 Calculate the y intercept of f(x) = -3x + 4 (1)

7.1.3 Calculate the x intercept of f(x) = -3x + 4 (2)

7.1.4 Draw the graph for f(x) = -3x + 4 Use a vertical and a horizontal scale of 1cm for 1 unit. (4)

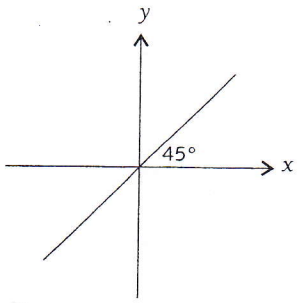
7.2 Calculate the equation for each of the sketch graphs below.

7.2.1



(3)

7.2.2



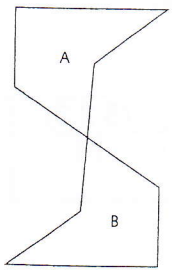
(3)

[15]

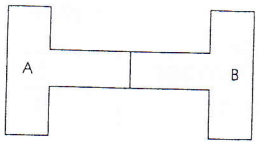
Question 8

Using **only one** transformation, state whether shape B has been translated, reflected or rotated in each situation. (5)

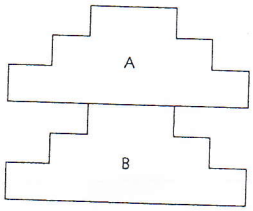
8.1



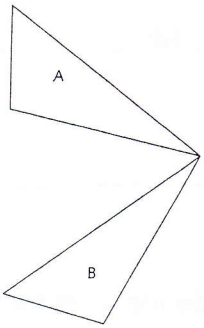
8.2



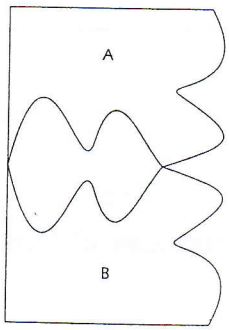
8.3



8.4



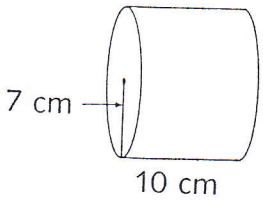
8.5



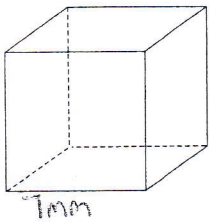
[5]

Question 9

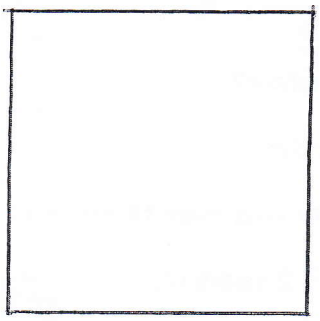
9.1 Calculate the volume of the 3-D figure below. (2)



9.2 Calculate the volume of a cube with a length of 7mm. (3)



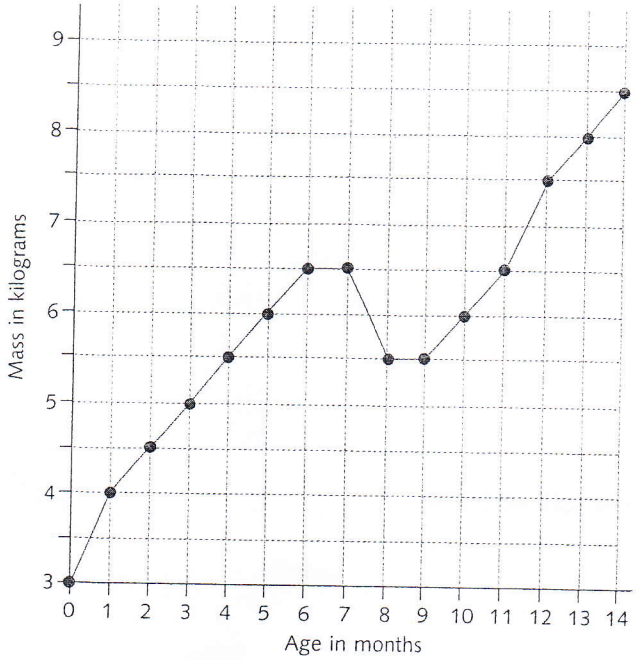
9.3 Calculate the length of the sides of a square with an area of 25m². (3)



[8]

Question 10

The graph below shows the mass of baby Mandisa from birth to her fourteenth month.



10.1 What was Mandisa's mass at 1 month? (1)

10.2 At what age was her mass 8kg? (1)

10.3 During which months did she gain the most mass? (2)

10.4 What happened during her 7^{th} and 8^{th} month? (1)

10.5 What was Mandisa's mass at 1 year old? (1)

10.6 During which months did her mass remain constant? (2)

10.7 Predict what Mandisa's mass will be at 15 months. (2)

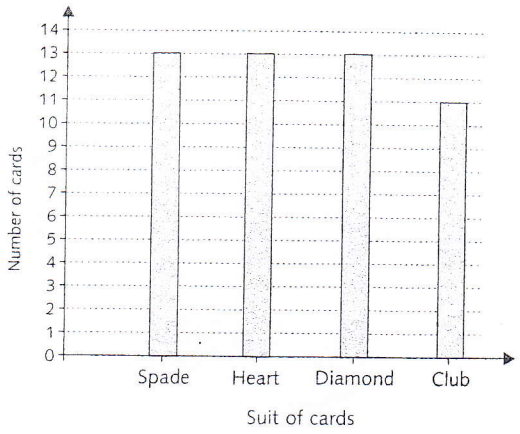
10.8 What was her average monthly increase in her mass over 14 months? (3)

10.9 What do you think her mass will be when she is 2 years old? (2)

[15]

Question 11

The graph below shows the number of playing cards in an incomplete suit of cards.



11.1 How many cards are there? (1)

11.2 What is the probability of drawing a spade? (1)

11.3 What is the probability of drawing a club? (1)

11.4 If the number of clubs is increased to 13, what is the probability of drawing a spade? (2)

11.5 Diamonds and hearts are red. What is the probability of drawing a red card? (2)

11.6 Spades and clubs are black. What is the probability of drawing a black card? (2)

[9]

Question 12

There are 96 boys and 120 girls in Grade 9.

12.1 What is the ratio of boys to girls in the grade?(Give the ratio in the simplest form) (2)

12.2 What is the ratio of girls to the total number of learners in Grade 9? (Give the ratio in its simplest form.) (3)

[5]

Question 13

13.1.1 Mr. Ranchod invests R25 500 in a scheme where compound interest is calculated at 8% per annum. He invests for 3 years. How much will he get out after 3 years? (3)

13.1.2 How much interest does he receive? (1)

13.2 The price of a large packet of chips is R5,99. If the price is increased by 15%, how much will you pay for the packet of chips? (2)

[6]

Formula Sheet – November 2010

Compound Interest : $A = P(1 + i)^n$

$y = mx + c$

$m = \dfrac{change\ in\ y}{change\ in\ x}$

$A = l\ x\ b$

$P = 2(l\ +\ b)$

$Area\ of\ triangle = \frac{1}{2}b\ x\ h$

$Circumference\ of\ circle = 2\pi r$

$Area\ of\ circle = \pi r^2$

$Surface\ area = 2(area\ of\ base) +\ (perimeter\ of\ base\ x\ height)$

$Volume = Area\ of\ base\ x\ height$