AS for file.

HILLCREST HIGH SCHOOL

Grade 10 Mathematics P1 **November 2012**
Time: 2 Hours **Marks:** 100

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of 6 questions.
2. Answer ALL the questions.
3. Clearly show ALL calculations, diagrams, graphs, et cetera that you have used in determining your answers.
4. Answers only will not necessarily be awarded full marks.
5. You may use an approved scientific calculator (non-programmable and non-graphical), unless stated otherwise.
6. If necessary, round answers off to TWO decimal places, unless stated otherwise.
7. Diagrams are NOT necessarily drawn to scale.
8. Number the answers correctly according to the numbering system used in this question paper.
9. Write legibly and present your work neatly.

QUESTION 1

1.1 Simplify:

1.1.1 $(a - 2b)(3a - 4b)$ (3)
1.1.2 $-2(2a - 3b)^2$ (4)
1.1.3 $(a + 2b)(a^2 - 2ab + 4b^2)$ (4)

1.2 Factorise:

1.2.1 $3a^2b - 9a^3b$ (2)
1.2.2 $5a^2 + 7a - 6$ (3)
1.2.3 $a^2 + a^3 - a - 1$ (4)
1.2.4 $2^{2x} - 9$ (3)

1.3 Simplify

1.3.1 $\frac{ay + by}{y}$ (2)

1.3.2 $1 + \frac{k}{2} - \frac{2k + 3}{7} - k$ (5)

1.3.3 $\frac{(3a^2b^3)^2}{m^3y^2} \div \frac{3^2a^2b^5}{my}$ (4)

1.3.4 $\left(-\frac{1}{8}\right)^{-2}$ (2)

[36]

QUESTION 2

2.1 Solve for y:

2.1.1 $2y + 3 = -3y - 7$ (2)
2.1.2 $-5y = y + 6(1 - y)$ (3)
2.1.3 $3 + \frac{y - 2}{4} = 4$ (4)
2.1.4 $ay - b = c$ (2)
2.1.5 $(y + 2)(y - 5) = 0$ (2)
2.1.6 $2y^2 - y = 10$ (4)
2.1.7 $34y + 3 \geq 7y - 6$ (3)
2.1.8 $9^{y+1} = 27$ (3)

2.2 Solve for a and b:

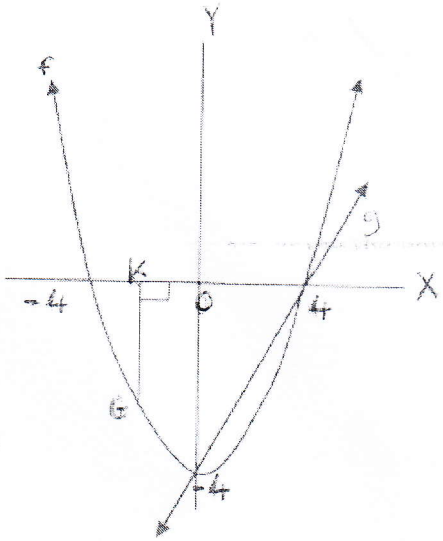
$a - 3b = -5$
$2a + 3b = -1$ (5)

[28]

QUESTION 3

Given in the diagram are sketch graphs of $f(x) = ax^2 + q$ and $g(x) = mx + c$.

(-4 ; 0) ; (4 ; 0) and (0 ; -4) are points on f.
(4 ; 0) and (0 ; -4) are points on g.



3.1 Determine the equation of g (2)
3.2 Determine the equation of f (3)
3.3 Write down the values of x for which $f(x) \leq g(x)$ (2)
3.4 Write down the range of f (1)
3.5 If OK = 2 units determine the length of KG (3)

[11]

QUESTION 4

Given $h(x) = -\frac{6}{x} + 2$

4.1 Write down the equations of the asymptotes (2)
4.2 Sketch the graph of h(x) showing any intercepts with the axes (3)
4.3 Write down the domain of h (2)

[7]

QUESTION 5

Consider the number pattern 21; 31; 41; _ ; _

5.1 Write down the next two terms (2)
5.2 Determine the n^{th} term (3)
5.3 Which term is equal to 2371? (3)

[8]

QUESTION 6

$A = P(1 + in)$ $A = P(1 + i)^n$

6.1 R5000 is invested at 5,6% pa interest compounded monthly. Calculate how much the investment is worth at the end of 6 years. (6)

6.2 Susan needs R40 000 for a holiday in 3 years time. Calculate how much she needs to invest at 6% pa compounded annually to achieve this. (4)

[10]