HILLCREST HIGH SCHOOL

Grade 9 Exam
June 2014

Examiner: Mr Reuben

Moderator: Mrs Cole

MARKS: 140

INSTRUCTIONS

1. This paper consists of 7 pages including the cover sheet.
2. Answer all questions on the paper provided.
3. You may not share calculators with anyone during the exam.
4. Round all answers off correctly to 2 decimal places unless otherwise stated.
5. Write your teacher's name on the top of your answer paper.
6. Number your answers correctly according to the numbers used in this question paper.
7. Show all working out.
8. Draw double margins.
9. It is in your best interest to set your work out neatly and legibly.

QUESTION 1

1.1 The next number in the sequence 1, 4, 9, 16, … is:

A. 22 B. 36 C. 27 D. 25

1.2 Which of the following numbers is a rational number?

A. B. C. D.

1.3 3^{-3} =

A. B. C. D. 27

1.4 683 000 000 in scientific notation is:

A. $6{,}83 \times 10^{8}$ B. $6{,}83 \times 10^{7}$ C. $6{,}83 \times 10^{-8}$ D. $68{,}3 \times 10^{8}$

1.5 Given the expression , what is the coefficient of x^2 ?

A. 2 B. -1 C. D. -3

1.6 =

A. B. C. D.

1.7 A _____ is a quadrilateral which has 2 pairs of adjacent sides equal

A. Parallelogram B. Kite C. Pentagon D. Rectangle

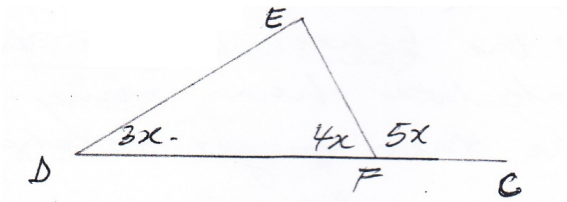
1.8 If a = 2, b = -3 and c = 5, then the value of $a^3(b^2 - c)$ =

A. 32 B. 84 C. 234 D. 864

1.9 In an equilateral triangle, each angle measures…

A. 90º B. 30º C. 45º D. 60º

1.10 The angle E in terms of x is …



A. $9x$ B. $7x$ C. $2x$ D. $12x$ [10]

QUESTION 2

2.1 State whether the following numbers are rational numbers or irrational numbers:

2.1.1 $\sqrt{81}$ 2.1.2 π 2.1.3 0,341 (3)

2.2 Simplify the following (show all working):

2.2.1 $(-3)^2 - (-3 - (-3))$ (3)

2.2.2 $\sqrt{36} + 5 \times -3 - \sqrt[3]{-8}$ (4)

[10]

QUESTION 3

3.1 Calculate the following:

3.1.1 Write down the prime factors of 30 (2)

3.1.2 Find the LCM of 16 and 20 (3)

3.2 Write the following ratios in their simplest form:

3.2.1 3 hours : 45 min (2)

3.2.2 2,8 : 0,14 (2)

3.3 There are 96 boys in a school who are in Grade 9. If the ratio of boys to girls is 2 : 3, how many girls are there? (3)

3.4 Peter takes a bus to school. The bus travels at an average speed of 40 km/h. If the school is 8 km from his house, calculate how many minutes he takes to get to school. (3)

[15]

QUESTION 4

4.1 Calculate the following (you may use your calculator, but show all calculations):

4.1.1 $\left(1\frac{1}{5} + 3\frac{3}{5}\right) \times 1\frac{1}{4}$ (3)

4.1.2 $\frac{2abc}{d} \times \frac{d}{a^2} \div \frac{bc}{d}$ (3)

[6]

QUESTION 5

5.1 What percentage did Mark get for his test if he got $\frac{27}{45}$? (2)

5.2 A watch is advertised at R1 249. After Christmas, the price drops to R999. Calculate the percentage reduction in the price of the watch. (3)

5.3 Jeff borrows R1 500 at 8% simple interest for 3 years. His friend, Matt, borrows R1 500 at 8% compound interest for 3 years. Who owes more money after 3 years? (7)

[12]

QUESTION 6

6.1 Write the following numbers in scientific notation:

6.1.1 2 000 000 (1)

6.1.2 0,00765 (2)

6.2 Simplify:

6.2.1 $2^2 \times 2^3$ (2)

6.2.2 $x^3 \div x^5$ (1)

6.2.3 $(4x^2)^0$ (1)

6.2.4 $(3m^2)^3$ (2)

6.2.5 $2^{-1} \times 6^3 \times 3^{-2}$ (4)

[13]

QUESTION 7

7.1 Given the pattern 5, 9, 13, 17, …

7.1.1 Determine the next 3 terms (3)

7.1.2 Determine the general rule for the n^{th} term of the pattern (3)

7.1.3 Find the 25^{th} term (2)

7.2 Given the formula for y = 3*x* -1, find the missing *y*-values

x	-4	-2	-1	0	2	3	5
y		-7		-1			14

(4)

[12]

QUESTION 8

8.1 Arrange the following expression in descending powers of **a** and simplify:

$3a + 8a^2 - 7a + 4a^2 - 11 + 8a - 2a^2 - 7$ (3)

8.2 A triangle has 3 sides of the following lengths: $3x + 4$, $7x - 5$ and $x + 3$. Write an expression for the perimeter of the triangle in the simplified algebraic form. (2)

8.3 From $(8x^2 + 5x - 11)$ subtract $(10x^2 + 7x + 22)$ (2)

8.4 Expand and collect like terms:

8.4.1 $2p(4 - q) + 4pq - 7p$ (2)

8.4.2 $(1 - 4x)(1 - 4x)$ (2)

8.4.3 $(3y - 7)(2y + 3)$ (3)

8.4.4 $(2x + 5)^2$ (3)

8.5 Simplify the following expression:

$$\frac{14(x^3 - 2x^2) - 42x}{7x^2}$$

(3)

[20]

QUESTION 9

Solve for x in each equation:

9.1 $x - 5 = -8$ (2)

9.2 $2x + 1 = 4x + 5 - 3x$ (3)

9.3 $7x - 6 + 3x = -5x - 3$ (3)

9.4 $9(3x - 2) = 3(7x + 6)$ (4)

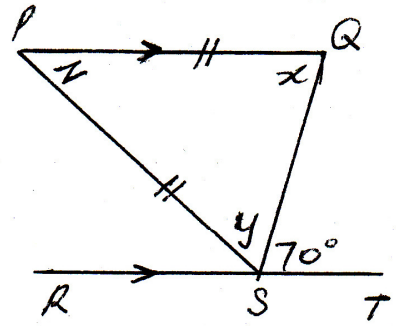
9.5 $\frac{x}{3} + \frac{2x-1}{4} = 1$ (4)

[16]

QUESTION 10

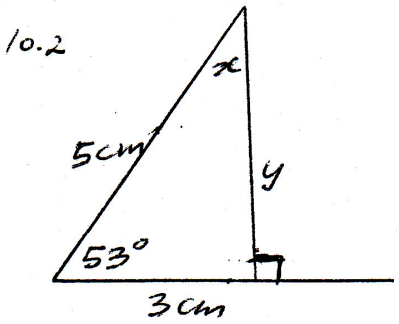
Solve for *x*, y, z etc in each diagram. Give reasons for each statement:

10.1



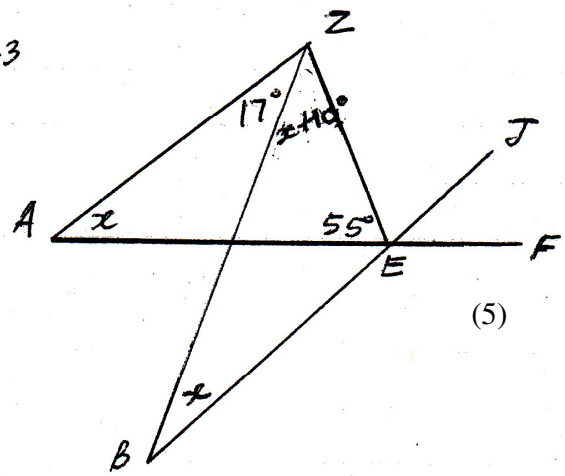
(5)

10.2



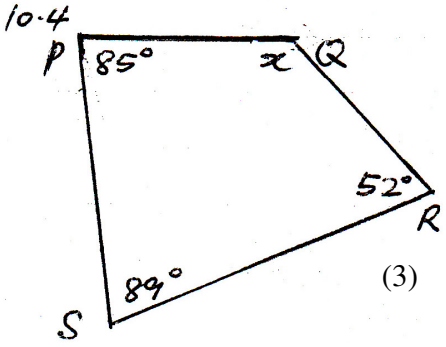
(4)

10.3



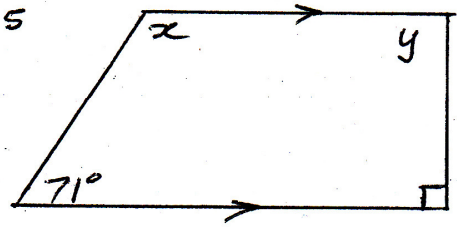
(5)

10.4



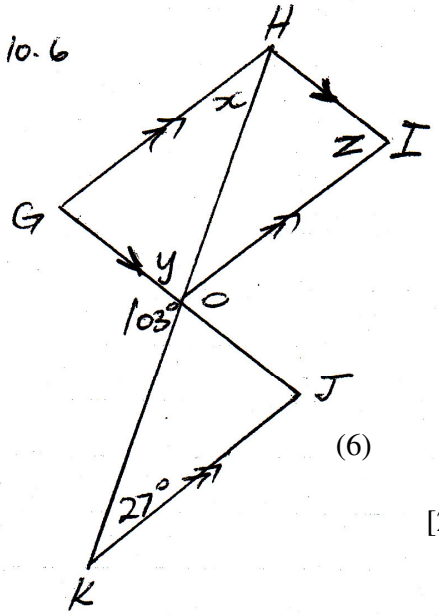
(3)

10.5



(3)

10.6



(6)

[26]

Total 140