Hillcrest High School

Mathematics

June 2014

Grade 8

Examiner: Mr S Griffiths

Moderator: Mr D Reuben

Instructions to candidates:

This paper consists of 5 pages and this cover page.

Answer all questions on the paper provided.

You may use calculators unless otherwise stated for a question.

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: 145 marks

Question 1

State in each case if the statement is true or false

1.1 $4x^3$ is the unlike term in $2x^2; 4x^3; 7x^2$ (1)

1.2 -5 is a natural number (1)

1.3 In $-5(mn)^3$ the base is -5mn (1)

1.4 Composite numbers have only 2 factors. (1)

1.5 2 angles that share a common arm and vertex are called adjacent. (1)
[5]

Question 2

Answer the following questions without the use of a calculator.

2.1 Find the sum of 4 576,85 and 389, 45 (2)

2.2 How many odd multiples does 100 have? (1)

2.3 How many odd factors does 150 have? (3)

2.4.1 Write 324 as a product of prime factors (2)

2.4.2 Using your answer from question 2.4.1) calculate the square root of 324. (2)

2.5 Stacey has 400 songs on her MP3 player, Thuto has 1200 on his and Erryn has 800 songs on her MP3 player. Write the number of songs each person has as a ratio and simplify it. (2)

2.6 Calculate: $300 - 100 \div (-20) \times 2$ (3)
[15]

Question 3

Calculate the following without using a calculator

3.1 $(\sqrt{13})^2$ (1)

3.2 $\frac{8 + (-8)}{16}$ (2)

3.3 $4(-n^4)^2$ (2)

3.4 $9^2 - (-4)^2$ (3)

3.5 $\sqrt{100 - 36}$ (2)

3.6 $7 \times 5 - 4 \times 3$ (2)

3.7 $\sqrt{4} \times \sqrt[3]{27}$ (3)

3.8 $\sqrt{16} - 9^2$ (3)

3.9 Write 750 000 000 000 000 kg in scientific notation. Round off to 2 decimal places (2)
[20]

Question 4

Consider the input / output diagram below:

$$x \rightarrow +5 \rightarrow \times 4 \rightarrow$$

Use the diagram above to complete the table below. Write down only the number and the answer

Input number	3	5	8	(4.4)	13
Output number	(4.1)	(4.2)	(4.3)	64	(4.5)

(5x1)
[5]

Question 5

Nombulelo builds patterns that consist of squares as shown below.

Picture 1

Picture 2

Picture 3

complete the table below. Write down only the number and answer.

Picture number	1	2	3	8	n
Number of squares	5	(5.1)	(5.2)	(5.3)	(5.4)

(1x4)

5.5 Use the table to complete the following flow diagram.

picture number → ☐ → ☐ → **number of squares**

(2)
[6]

Question 6

Complete the following:

6.1 $4x - 6y + 3$ is called an _____ (1)

6.2 The coefficient of y is_____ (1)

6.3 The constant is ____ (1)

6.4 There are _____ terms in the expression. (1)
[4]

Question 7

Simplify if possible

7.1 $8x + 5x$ (1)

7.2 $3c^2 + 4c$ (1)

7.3 $2cd + 3dc - 4cd + 12dc$ (2)

7.4 $3x^2y - 4xy^2 + 8x^2y + 5xy^2$ (2)

7.5 $15p \times -3q$ (1)

7.6 $-11pq^3 \div pq \times 13p^7$ (1)

7.7 $\sqrt{49x^2y^6}$ (2)

[10]

Question 8

Solve the following equations and thus find the value of the variable

8.1 $x - 5 = 8$ (1)

8.2 $3x - 2 = 40$ (2)

8.3 $6y - 9 = 33$ (2)

8.4 $3(10 - x) = -15$ (3)

8.5 $3x + 12 = 7x - 4$ (3)

[11]

Question 9

Convert the following statements into algebraic expressions

9.1 A number added to nine. (1)

9.2 Four times a number. (1)

9.3 Half of a number. (1)

9.4 Four less than three times a number. (2)

[5]

Question 10

Convert the following statements into algebraic equations **and** solve the equations

10.1 When a number is decreased by 37, the answer is 21. What is the number? (2)

10.2 The sum of 12 and a number equals three times the number. What is the number? (3)

10.3 Sanele is 4 years older than his sister. Their combined age is 20. How old is Sanele? (4)

[9]

Question 11

Determine the numerical value of each of the following expressions:

11.1 $E = k - 4$ when $k = 8$ (2)

11.2 $H = \frac{p}{-2} - 10$ when $p = -8$ (3)

11.3 $B = v^2 - 5$ when $v = 6$ (3)

11.4 $L = m - n$ when $m = 0$ and $n = -4$ (3)

11.5 If $x = 2$ and $y = -3$, find the value of: $(xy)^2$ (4)

[15]

Question 12

Give the name of the geometric descriptions given in each of the following statements.

12.1 An angle that is more than 180° but less than 360° (1)

12.2 2 lines that are next to each other and will never meet. (1)

12.3 2 angles that share a common vertex and a common arm. (1)

12.4 2 or more angles that add up to 180° (1)

Complete each of the following statements by writing down the **missing words or values only**

12.5 The sum of the internal angles of a triangle is.... (1)

12.6 The external angle of a triangle is equal to the _(12.6.1)_ of the _(12.6.2)_ interior _(12.6.3)_. (3)

12.7 Lines that meet at 90° are.... (1)

12.8 There are ___ degrees in one revolution (1)

12.9 A triangle with all 3 sides different lengths is called (1)

[11]

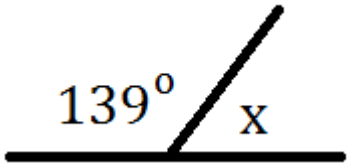
Question 13

13.1 What is the complement of 80° (2)

13.2 What is the supplement of 45° (2)

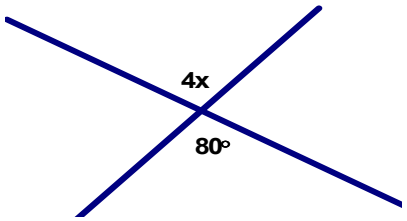
13.3 Calculate, with reasons the angles marked with letters

13.3.1



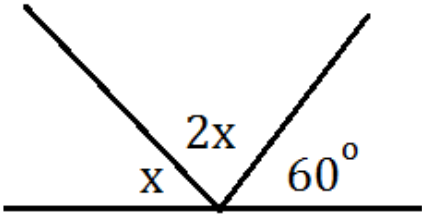
(2)

13.3.2



(2)

13.3.3



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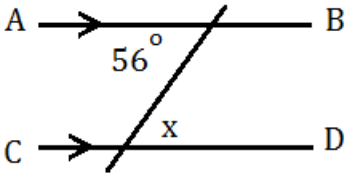
13.3.4



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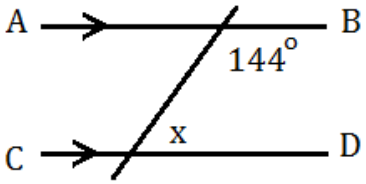
13.3.5



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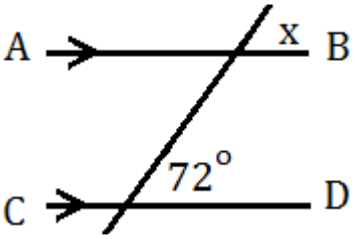
13.3.6



(3)

[20]

Question 14

14.1 Complete the statement:
The angles in a triangle add up to _____degrees (1)

14.2 Name the following triangles

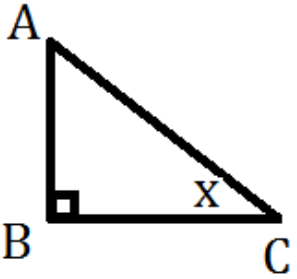
a) A triangle that has only got angles that are less than 90° (1)

b)

(1)

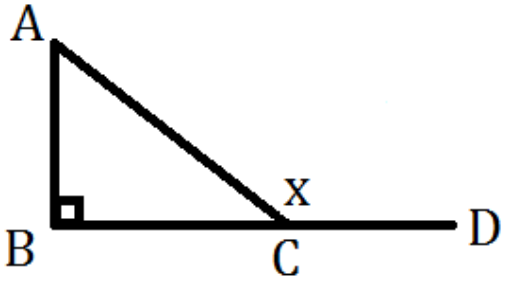
14.3 Calculate the sizes of *x* if angle A is 34°. Give reasons for your

a)



(3)

b)



(3)

[9]

Total: 145 marks