RONDEBOSCH BOYS' HIGH SCHOOL

MATHEMATICS

10 June 2014 **2 HOURS**

Examiner: M. Barnard **Grade 8**

Moderator: D. Geldenhuys **150 MARKS**

Instructions:

1. **NO CALCULATORS ARE ALLOWED!!!**
2. There are TWO sections in this exam. Answer BOTH sections.
3. There are 11 questions. Answer all the questions.
4. Show all working.
5. **Answer QUESTION 1 and QUESTION 2 on the answer sheet. Staple the answer sheet to the front of your answers.**
6. Number your answers exactly as the questions are numbered on the exam paper.
7. Use **only** blue or black pens.

SECTION A

QUESTION 1

For each of the following questions choose the correct answer. Make a cross (X) over the letter **(i.e. A, B, C, D)** which corresponds to your answer on **the answer sheet provided.**

1.1 Which statement is true?

A. All integers are natural numbers.
B. All real numbers are rational numbers.
C. All integers are real numbers.
D. All non-real numbers are irrational numbers.

1.2 Calculate $\sqrt{144+25}$

A. 17
B. 13
C. 7
D. −7

1.3 The complement of 63° is:

A. 27°
B. 117°
C. 297°
D. 7°

1.4 $x + 2x =$

A. $3x^2$
B. $2x^2$
C. $3x$
D. x^3

1.5 $3(a + b) =$

A. $3ab$
B. $3a + b$
C. $3a + 3b$
D. $3 + a + b$

1.6 What is the value of the expression $3x - 4$ when $x = 5$?

A. 9
B. 11
C. 3
D. -5

1.7 Replace the $*$ with the correct sign: $-15 * -3$

A. $<$
B. $=$
C. $>$
D. $\geq$

1.8 $0{,}36$ as a common fraction is:

A. $\frac{1}{4}$
B. $\frac{3}{6}$
C. 36
D. $\frac{9}{25}$

1.9 $\frac{5}{8}$ as a percentage is:

A. 58%
B. $37{,}5\ \%$
C. $62{,}5\%$
D. Not possible

1.10 $\frac{0\times1}{1\times1} =$

A. 1
B. 0
C. Undefined
D. ½

[10]

QUESTION 2

Complete the following table by placing a ✓ in the appropriate column. **Answer this question on your answer sheet**.

Number		***Natural***	***Integer***	***Rational***	***Irrational***	***Real***
2.1	3					
2.2	$\sqrt{25}$					
2.3	$\frac{22}{7}$					
2.4	$3,\dot{1}\dot{2}$					
2.5	2,315…					

[5]

QUESTION 3

3.1 From the list of numbers below, choose a number that:

8 13 14 18 24 49 77

3.1.1 is a multiple of 2 and 3 (1)

3.1.2 is a perfect square (1)

3.1.3 is a prime number (1)

3.1.4 is a factor of 24 (1)

3.1.5 is the square root of 169 (1)

3.1.6 is the Highest Common Factor of 48 and 72 (1)

3.2 Express 360 as a product of its prime factors. (3)

[9]

QUESTION 4

Evaluate each of the following. Show all your working out:

4.1 $2 - 4(2 - 7)$ (2)

4.2 $(4^2 \times 2 - \sqrt{64}) \div 3$ (3)

4.3 $\frac{1\frac{1}{2}+3\frac{3}{4}}{\frac{3}{8}-\frac{1}{4}}$ (6)

[11]

QUESTION 5

Examine the following algebraic expression:

$$7y^2 + \frac{y^5}{3} - 6y + 2$$

5.1 How many terms are there in the expression? (1)

5.2 Write down the coefficient of y^5. (1)

5.3 Write down the constant term. (1)

5.4 Rearrange the expression in descending powers of y. (2)

5.5 If $y = -1$ calculate the value of the expression. (3)

[8]

QUESTION 6

Simplify:

6.1 $a + a + a$ (1)

6.2 $a \times a \times a$ (1)

6.3 $-5a - 3a + 2a$ (1)

6.4 $-3a^2 - (-5a^2)$ (2)

6.5 $-4x \times 2x^2$ (2)

6.6 $3a^3b^2 \times (-5ab^4)$ (3)

6.7 $(-2a^3b^4)^2$ (3)

6.8 $3x^2y - 12y^2x + 7xy^2$ (2)

6.9 $-3(x - 2) - 4(2x + 3)$ (4)

6.10 $\frac{20x^6y}{5x^2y^3}$ (3)

6.11 $\frac{x^2+4x^2}{10x^2}$ (2)

6.12 $\sqrt{64a^8e^{10}}$ (3)

6.13 Use columns to add $2a - c + b$ to $3a + 3b + 3c$ (3)

[30]

QUESTION 7

7.1 Write algebraic expressions for the following:

7.1.1 A number 3 more than x. (1)

7.1.2 John's age 5 years ago if he is now p years old. (1)

7.1.3 There are n number of fish in a bowl. How many fish are there in m bowls? (1)

7.1.4 Five times the square of x. (1)

7.1.5 A ticket to a movie costs x rand and a Coke costs y rand. What will it cost to treat yourself and three friends to a movie and a Coke? (2)

7.2 Solve for x :

7.2.1 $x - 6 = -20$ (1)

7.2.2 $\frac{x}{-6} = 12$ (1)

7.2.3 $2x + 5 = 5x - 7$ (3)

7.2.4 $4(x - 2) - 2(x + 1) = 4$ (4)

[15]

QUESTION 8

8.1 Complete the following statements:

8.1.1 An angle greater than $180°$ and less than $360°$ is called a(n)_____ angle? (1)

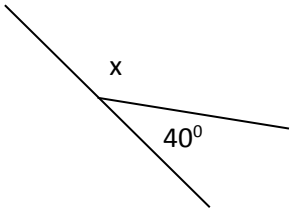
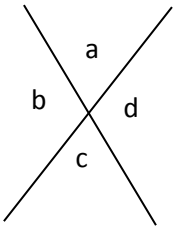
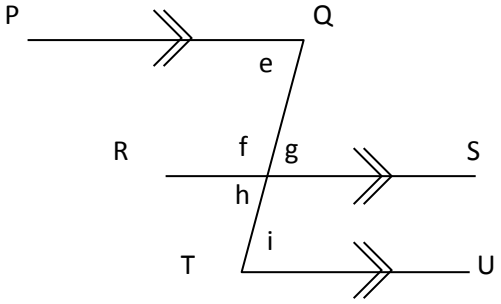
8.1.2 What is the supplement of $110°$? (1)

8.1.3 What do we call a triangle that has 3 sides that are of different lengths? (1)

8.1.4. Together 37^0 and 53^0 are_____ angles. (1)

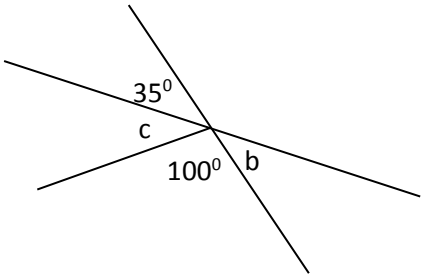
8.1.5 If lines are parallel, co-interior angles add up to_____° (1)

8.2 For each of the following questions, **give ONLY the correct reason for the corresponding statement.**

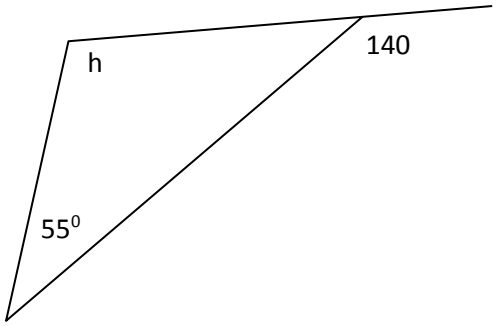
	Statement	Reason
	$x + 40° = 180°$	8.2.1_____(1)
	a = c $a + b + c + d = 360°$	8.2.2_____(1) 8.2.3_____(1)
	$e + f = 180°$ $e = g$ $i = g$	8.2.4_____(1) 8.2.5_____(1) 8.2.6_____(1)

8.3 Find the values of the variables in each of the following. **Give reasons for your answers.**

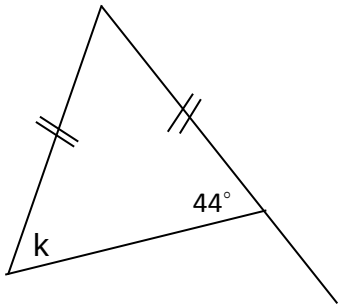
8.3.1 (2)



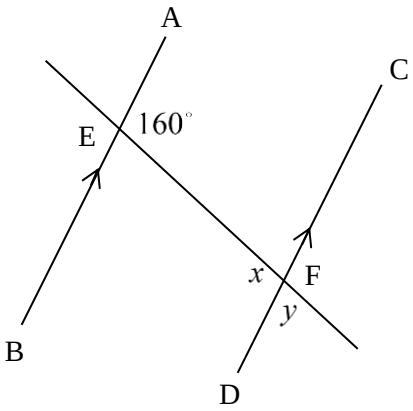
8.3.2 (1)



8.3.3 (1)



8.3.4 (2)



[17]

Total Section A: 105

Section B

QUESTION 9

9.1 Simplify:

9.1.1 $\frac{(-2a^2b^4)^2 5ab^2}{\sqrt{100a^4}}$ (4)

9.1.2 $\frac{17x^6 - x^6}{2x^3} - (2x)^2 \times 2x$ (3)

9.1.3 $2ab(a^2 + b^2) - (a^3b + 2ab^3)$ (3)

9.2 Jordan spent part of his holiday climbing in the Drakensberg. On the first day he climbed $(3x^2 - 4xy + 7)$ metres. On the second day he climbed $(-2 - 2x^2 + xy)$ metres. How much further did he climb on the first day than on the second day?

(3)

9.3 Oliver's calculator is broken. Suggest a **short method** to help Oliver calculate the answer to the following: $\mathbf{2 \times 61 + 3 \times 61 + 5 \times 61.}$ Show your working and your answer. (2)

9.4 If the following are true:

$A + B + C = 160$

$B + C = 90$

$X + A = 90$

Determine the value of X (3)

[18]

QUESTION 10

10.1 Solve for the unknown variable in the following:

10.1.1 $\frac{2m-12}{3} = 8$ (3)

10.1.2 $-3(6-y) + 2y^2 = 9 + 2y(y+3)$ (4)

10.1.3 $\frac{1}{2}(4x-6) = 2(x-4)$ (3)

10.2 Use an equation to answer the following:

You are trying to determine the date in April when your Maths teacher celebrates her birthday. She gives you the following clue: “My birthday is the second of three consecutive dates which add up to 72.” On which date does she have her birthday? (4)

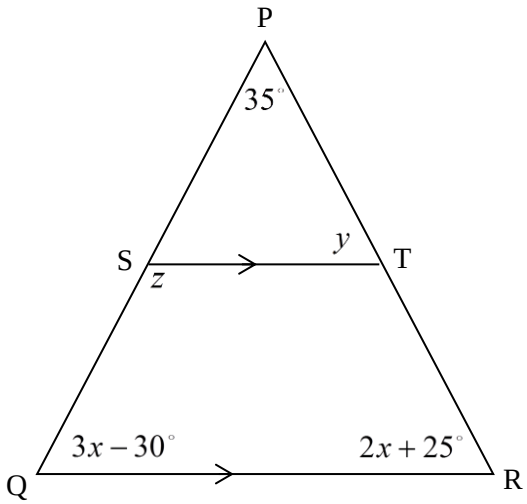
[14]

QUESTION 11

11.1 One angle is double the size of its complement. What is the size of the larger angle? (1)

11.2 One angle measures 10° more than another. If these two angles are supplementary, what is the size of the smaller angle? (1)

11.3 Calculate the values of x, y and z in the following diagram. Show all steps and give reasons for your answers.



(7)

11.4 What is the size of the angle between the hour and minute hands of a clock at:

11.4.1 6 pm? (1)

11.4.2 6:20 pm? *(Give the acute angle only)* (3)

[13]

Total Section B: 45

Grand total: 150

ANSWER SHEET

NAME: _____ **Teacher:**_____

Question	1	2	3	4	5	6	7	8	Total Section A	9	10	11	Total Section B	Total
Mark	10	5	9	11	8	30	15	17	105	18	14	13	45	150
Actual														

QUESTION 1

1.1	A	B	C	D
1.2	A	B	C	D
1.3	A	B	C	D
1.4	A	B	C	D
1.5	A	B	C	D
1.6	A	B	C	D
1.7	A	B	C	D
1.8	A	B	C	D
1.9	A	B	C	D
1.10	A	B	C	D

QUESTION 2

Number		*Natural*	*Integer*	*Rational*	*Irrational*	*Real*
2.1	3					
2.2	$\sqrt{25}$					
2.3	$\frac{22}{7}$					
2.4	$3,\dot{1}\dot{2}$					
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