

**Mathematics Exam**

14 November 2013

2 hours

**Moderator:**

Grade 8

100 marks

**Examiner:** B. Friend

**Instructions:**

1. Answer all questions, showing all working out.
2. Calculators may be used.
3. All answers correct to two decimal places, unless stated otherwise.

**Question 1:**

Four possible answers are given for each question. Choose the correct answer, and write down only the question number and the letter of the correct answer.

- 1.1. The prime factors of 63 are:  
 A. 1, 3, 7, 9, 63    B. 2, 3, 5, 7    C. 3, 7    D. 63, 126, 189
- 1.2. Which of these is a rational number?  
 A.  $\sqrt{5}$     B. 0,83452...    C. 0,3̄    D.  $\sqrt{-4}$
- 1.3. The lowest common multiple of 6, 8 and 12 is:  
 A. 24    B. 2    C. 48    D. 1

Consider the expression  $8y + 7y^3 - 2y^2 + 4$  and answer 1.4, 1.5 and 1.6:

- 1.4. What is the constant value?  
 A. 8    B. 7    C. -2    D. 4
- 1.5. What is the co-efficient of  $y^2$ ?  
 A. 8    B. 7    C. -2    D. 4
- 1.6. If  $y = -1$ , the value of the expression is:  
 A. 17    B. -13    C. -9    D. 3
- 1.7. The value of  $9 + (-14) - (-2) =$   
 A. -7    B. 25    C. -3    D. 3

1.8.  $\sqrt{\frac{144x^4}{36y^6}}$  is equal to:

- A.  $\frac{12x^2}{6y^3}$     B.  $\frac{12x^4}{6y^6}$     C.  $\frac{72x^4}{18y^6}$     D.  $\frac{72x^4}{18y^6}$

1.9. Which of these is NOT a property of a rectangle?

- A. Opposite sides equal    B. Opposite angles equal  
 C. Opposite sides parallel    D. Diagonals bisect at  $90^\circ$

1.10. Which angles given below are NOT supplementary?

- A. Angles in a triangle    B. Angles on a straight line  
 C. Angles inside a rhombus    D. Co-interior angles of parallel lines (10)

**Question 2:**

True or false: Write down only the number of the question and TRUE or FALSE.

- 2.1. The complement of  $75^\circ$  is  $15^\circ$ .
- 2.2. Equilateral triangles have an angle equal to  $90^\circ$ .
- 2.3. Rectangles and parallelograms are examples of quadrilaterals.
- 2.4. Alternate angles between parallel lines are equal.
- 2.5. The theorem of Pythagoras only works in right angled triangles.
- 2.6. The interior angles in a quadrilateral add up to  $180^\circ$ .
- 2.7. The formula for the area of a circle is  $2\pi r r$ .
- 2.8. The smallest prime number is 2.
- 2.9.  $a \times a \times a \times a = 4a$
- 2.10. The index of  $2x^2 - 3x^3 - 1 - 5x$  is 2. (10)

**Question 3:**

Solve for x:

- 3.1.  $5x + 3 = 2x - 12$  (3)  
 3.2.  $2(x-2) - 5(x-1) = 2x - 1$  (4)

3.3. I think of a number. I multiply it by 7, then add 5. My answer is 40. What is the original number? (3)

**Question 4:**

Simplify the following, showing all working out.

- 4.1.  $\sqrt{169} - 144$  (1)  
 4.2.  $9(2\sqrt{2})^2$  (1)  
 4.3.  $-2x^2 + 7x^3 - 5x^2 + 3x^3$  (2)  
 4.4.  $\frac{14a^2b + 7ab^2 - 21a^2b^2}{7ab}$  (3)  
 4.5.  $\frac{4a-a}{3} - \frac{(4a+6a)}{5}$  (3)

Question 5:

The table below shows a relationship between x and y.

x	1	2	3	4	7	B	5	35	D
y	2	4	6	A	14	20	C	70	100

- 5.1. Write down the letters A, B, C and D and the answers next to the letter. (4)
- 5.2. Write down the formula for the relationship in the form  $y = \dots\dots\dots$  (1)
- 5.3. If  $x = 37$ , find the value of y. (1)

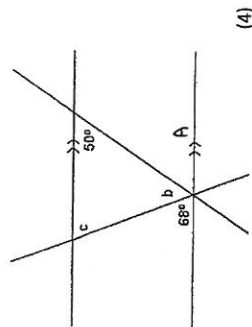
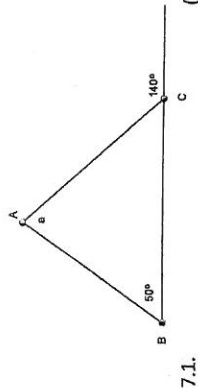
Question 6:

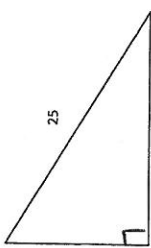
6.1. Write the following ratios in the simplest form:

- 6.1.1. 90 minutes :  $1\frac{2}{3}$  hours (2)
- 6.1.2.  $2\frac{1}{2} : 1\frac{1}{3}$  (3)
- 6.2. Divide R44,80 in a ratio of 5 : 3 (2)
- 6.3. Increase 48 in a ratio of 4 : 3 (2)

Question 7:

Calculate the unknown values giving all reasons:



- 7.3.  (4)

Question 8:

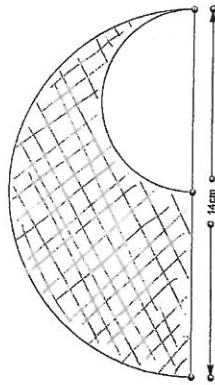
The marks out of 50 for a Grade 8 Math test are given below.

50	42	37	34	43
25	48	37	43	23
38	30	49	41	35

- 8.1. Draw a stem leaf diagram for this information. (3)
- 8.2. Determine the mean mark. (3)
- 8.3. What is the mode? (1)
- 8.4. Give the median for the data. (1)
- 8.5. What is the range of the data? (1)

Question 9:

- 9.1. Calculate the circumference of the circle with radius of 5cm. (3)
- 9.2. Determine the radius of the circle with the area of  $72\text{cm}^2$  (4)
- 9.3. Calculate the size of the shaded area if the radius of the small circle is half the radius of the large circle and the radius of the large circle is 14cm. (7)



Question 10:

- A fish pond is 0,40m deep and has a radius of 2m.
- 10.1. How much water can the fish pond hold? (3)
- 10.2. What is the total surface area of the inside of the fish pond? (7)
- 10.3. If the paint costs R8,20 per  $\text{m}^2$ , what will it cost to paint the inside of the fish pond? (2)

TOTAL: 100 marks