

# SHARP

**November Exam**  
**Grade 8 Mathematics**

**Marks: 150**

**Time: 2 hours**

**Instructions:**

Read the following instructions carefully before answering the questions:

1. This question paper consists of 9 pages and two sections.
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 off answers 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 neatly and legibly.

**Good Luck**

## Section 1 - Algebra

### Question 1

- 1.1. Without the use of a calculator find the answer for the following. Leave your answer in exponential form.

$$\sqrt[3]{13\,824} \quad (2)$$

- 1.2 Find the HCF and LCM for the following three numbers: 868, 372 and 992. (3)

- 1.3. Calculate the following without using a calculator (show all working out):

$$1.3.1. \frac{-48+6}{-7} + (-3)(-4)(-2) \quad (3) \quad 1.3.2. \sqrt{(-8)(-2)} + \sqrt[3]{(-8)(27)} \quad (3)$$

- 1.4. Write the following numbers in scientific notation:

$$1.4.1. 1\,007\,996\,550 \quad (1) \quad 1.4.2. 6\,302\,520 \quad (1)$$

- 1.5. Write the following scientific notation numbers as normal numbers:

$$1.5.1. 4.32 \times 10^4 \quad (1) \quad 1.5.2. 9.0045 \times 10^5 \quad (1)$$

- 1.6. Simplify the following and leave with positive exponents:

$$1.6.1. \frac{x^2y^3}{(x^2)^3} \div \frac{(x^3y^4)^0}{x^4y} \quad (4) \quad 1.6.2. \frac{\sqrt{x^4y^6}}{z^2} \times \frac{z^4y^3}{x^4} \quad (2)$$

- 1.7. Given the following pattern: 2      6      12      20      30.

- 1.7.1. Determine the rule used to find the pattern. (2)

- 1.7.2. Find the value of the 9<sup>th</sup> item in the pattern. (2)

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## Question 2

2.1. Given the following expression:  $4x^5 - \frac{3}{5}x^3 + 7x - 12$

2.1.1. How many terms does the expression have? (1)

2.1.2. What is the value of the constant? (1)

2.1.3. What is the coefficient of  $x^3$ ? (2)

2.1.4. If  $x = -3$  what is the value of the expression? (3)

2.2. Simplify the following:

2.2.1.  $2x(3x^2 - 4x + 7) - 3x(2x^2 + 8x - 9)$  (3)

2.2.2.  $\frac{5x^4 + 15x^2 - 25x}{5x}$  (2)

2.3. Solve for  $x$ :

2.3.1.  $\frac{x}{8} + 9 = 2$  (2)

2.3.2.  $\frac{3x}{5} - 7 = 5$  (3)

2.4. The perimeter of a rectangle is  $20\text{cm}^2$ . The one side of the rectangle is  $x\text{cm}$  and the other side is  $2\text{cm}$  shorter than the first side. Find the lengths of the two sides. (3)

[20]

## Question 3

3.1. Redraw the following table on your test paper and fill in the missing values: (6)

Fraction	Decimal	Percentage
$\frac{2}{3}$		
	0.65	
		82%

3.2. Jamie, Anita and Thando are completing a project together. Jamie does 12% of the work, Anita does 0.3 parts of the work and Thando does  $\frac{1}{4}$  of the work.

3.2.1. Who does the most work? (2)

3.2.2. How much work still needs to be done as a percentage? (3)

[11]

#### Question 4

Given the table below:

<b>x</b>	1	2	3			8		16
<b>y<sub>1</sub></b>	36	32	28	24				
<b>y<sub>2</sub></b>	36	18	12		6		3	

4.1. In your test paper, redraw the table and fill in the missing values. (5)

4.2. Give the rule for each of the graphs for  $y_1$  and  $y_2$ . (2)

4.3. For each graph say whether it is increasing, decreasing or constant and whether it is linear or non-linear. (2)

4.4. On the same set of axes, draw the two graphs from the table. (4)

4.5. Which graph is the correct graph if  $x$  represents the month, and the  $y$ 's represent two different ways the value of an item can be calculated. Give a reason for your answer. (2)

[15]

#### Question 5

A bag contains 16 marbles in total. 4 of the marbles are white, 4 are red, 4 are yellow and the rest are blue. Now answer the following questions:

5.1. What is the chance of choosing a white marble? (1)

5.2. What is the chance of choosing a green marble? (1)

5.3. What is the chance of choosing a red or a blue marble? (2)

## Section 2 – Geometry

### Question 6

6.1. Construct the following without the use of a protractor.

6.1.1. The perpendicular bisector of a line measuring 5cm. (4)

6.1.2. Draw an equilateral triangle with sides of 4cm. (5)

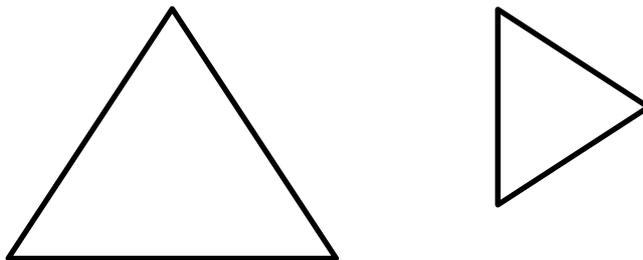
6.2. Match the descriptions given in column B, with the name of the shape given in column A.

Column A	Column B
6.2.1 Trapezium	A. Opposite sides parallel and equal
6.2.2. Rhombus	B. One set of sides parallel.
6.2.3. Parallelogram	C. Adjacent sides equal.
6.2.4. Kite	D. All sides equal and parallel, and all angles equal
6.2.5. Square	E. All sides equal and parallel.

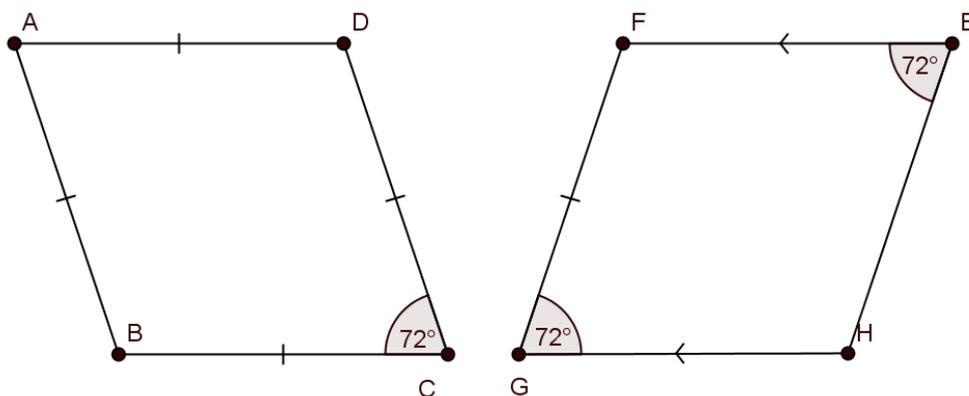
(5)

6.3. Say if the following pairs of shapes are similar or congruent or neither and give a reason for your answer.

6.3.1. (2)



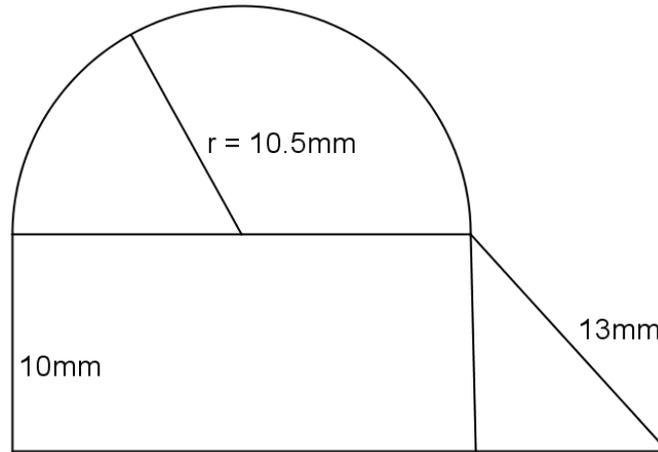
6.3.2. (2)



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8.3. Given below is a polygon.



8.3.1. Determine the perimeter of the shape. (4)

8.3.2. Determine the area of the shape. (3)

8.4. A cereal manufacturer would like to create a new box for their new cereal. The box must be 31cm tall, 20cm across and 80mm wide.

8.4.1. The cereal manufacturer needs to know how much design space the art team has to fill with their designs.

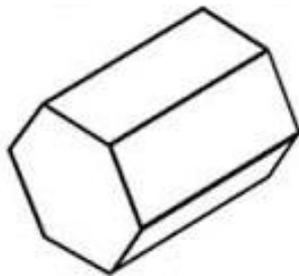
8.4.1.1. Draw a net to show the art team how much space each design would need to take up. (3)

8.4.1.2. Determine the amount of cardboard required to make one box. (3)

8.4.2. If the top 4cm of the box are left for air, what volume of space can be filled with cereal? (3)

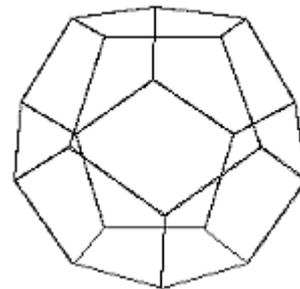
8.5. Give the names of the following 3D-shapes.

8.5.1.



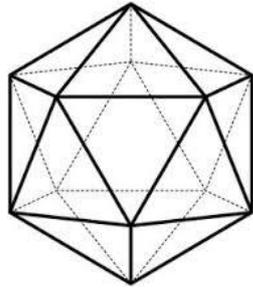
(1)

8.5.2.



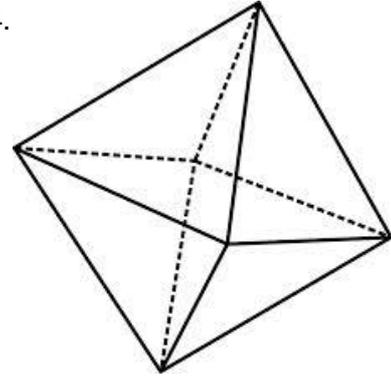
(1)

8.5.3.



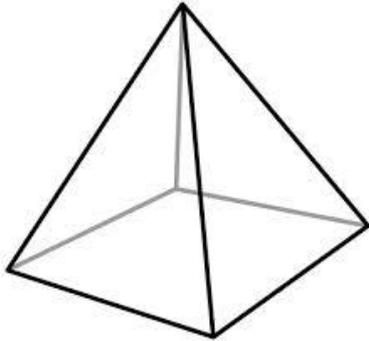
(1)

8.5.4.



(1)

8.5.5.

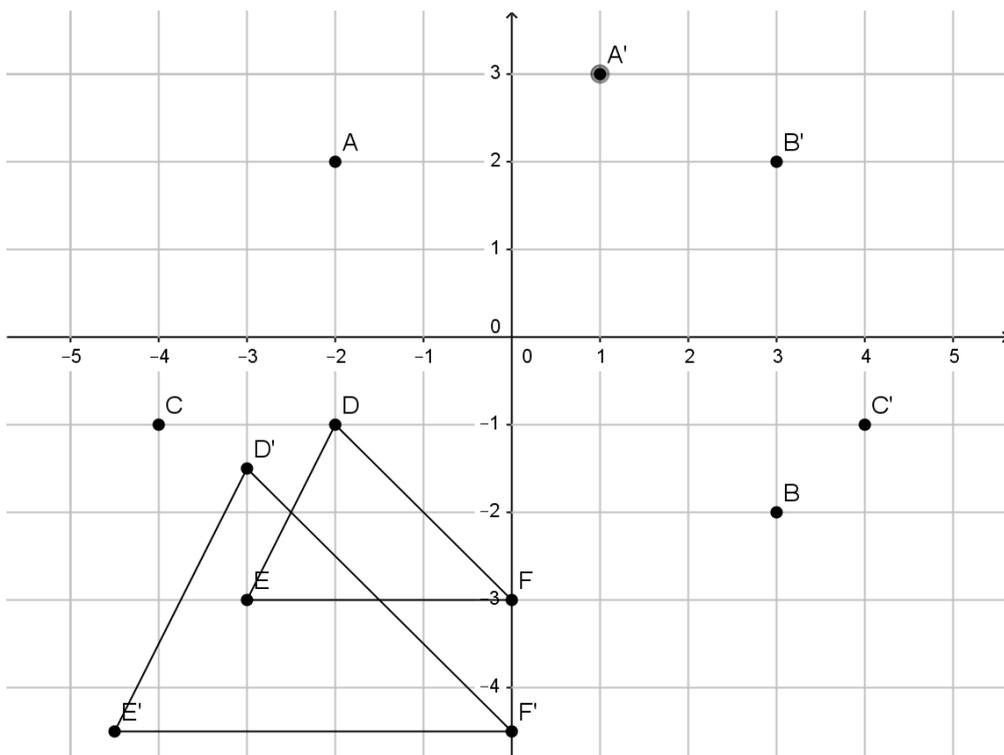


(1)

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### Question 9

9.1. Determine the rule for each of the transformations given on the Cartesian plane below. (5)



9.2. Given the coordinate and the rule, write down the new coordinate for each of the following:

9.2.1. G (-7; 3) reflected about the x-axis to become G'. (1)

9.2.2. H (2; -3) reduced by a factor of 3 to become H'. (1)

[7]

### Question 10

Given below are the cricket scores of South Africa in a game against India in October 2015.

17 34 51 36 19 0 18 13 19 9 4

10.1. Draw a stem-and-leaf plot to represent the above data. (2)

10.2. Determine the:

10.2.1. mean (2)

10.2.2. mode (1)

10.2.3. median (1)

10.2.4. Range (1)

10.3. Represent the data using a bar graph. (3)

10.4. If each of the cricket players scored an extra five runs, how would this affect the average?  
Give a reason for your answer. (2)

[12]

**Grand Total [150]**

