

SMARTWIZ

GRADE 8 MATHEMATICS EXAM

MARKS: 100

MARKS	
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TIME: 2 hours

SCHOOL _____

CLASS (e.g. 4A) _____

SURNAME _____

NAME _____

MYST PATHWORKS

Instructions for Students:

- > Read all instructions carefully before beginning the exam.
- > Write your name and student ID clearly on the answer sheet/booklet.
- > Answer all questions unless otherwise stated.
- > Show all your work/calculations where applicable.
- > Write clearly and legibly.
- > Use blue or black ink only. * Do not use correction fluid/tape.
- > No electronic devices (calculators, phones, etc.) are allowed unless explicitly permitted.
- > Raise your hand if you have any questions.
- > Do not talk to other students during the exam.
- > Any form of cheating will result in disqualification.

This test consists of 4 pages, excluding the cover page.

SECTION A: WHOLE NUMBERS, INTEGERS AND EXPONENTS (25 MARKS)**Question 1: Whole Numbers and Integers (10 marks)**

1.1 Round off 3 958 to the nearest thousand.

1.2 Write in expanded notation: 9 402

1.3 Simplify:

(a) $75 \times 13 =$ _____

(b) $221 \div 13 =$ _____

1.4 Arrange in ascending order: -5, 2, -10, 0, 3

Question 2: Exponents (15 marks)

2.1 Simplify:

(a) $4^2 + 2^3 =$ _____

(b) $10^2 - 3^2 =$ _____

(c) $(2^3)^2 =$ _____

2.2 Write in exponential form:

(a) $3 \times 3 \times 3 \times 3 \times 3 =$ _____

(b) $5 \times 5 =$ _____

2.3 Simplify and show all steps:

(a) $6^2 + 2^3 - 4 =$ _____

SECTION B: ALGEBRA, EQUATIONS AND GRAPHS (30 MARKS)**Question 3: Algebraic Expressions (10 marks)**

3.1 Simplify: (a) $2x + 4 - x + 7 =$ _____

(b) $5(x - 1) + 3 =$ _____

3.2 Factorise: (a) $6x + 12 =$ _____

(b) $ab + a =$ _____

3.3 Expand: (a) $(x - 5)(x + 2) =$ _____

Question 4: Equations (10 marks)

4.1 Solve for x: (a) $x - 4 = 10$

(b) $2(x + 1) = 12$

(c) $4x - 3 = x + 9$

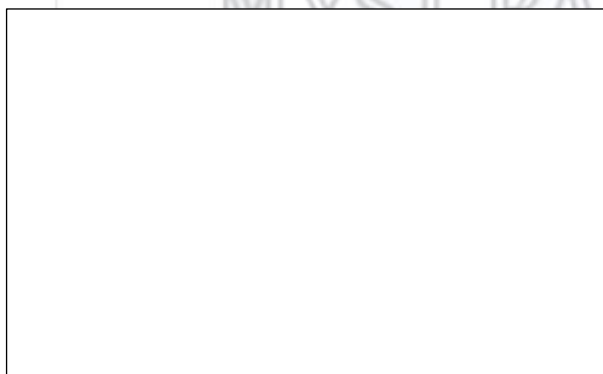
Question 5: Graphs (10 marks)

5.1 Complete the table for $y = 2x + 1$:

x -1 0 1 2 3

y

5.2 Draw the graph of $y = 2x + 1$ using the table above:

**SECTION C: GEOMETRY AND MEASUREMENT (25 MARKS)****Question 6: Properties of Shapes (10 marks)**

6.1 Define a quadrilateral.

6.2 Name two types of triangles.

6.3 How many lines of symmetry does a regular hexagon have?

6.4 What is the sum of interior angles in a pentagon?

Question 7: Area and Volume (15 marks)

7.1 Area of triangle: base = 8 cm, height = 5 cm

7.2 Area of trapezium: a = 6 cm, b = 10 cm, height = 4 cm

7.3 Volume of cube: side = 5 cm

7.4 Volume of rectangular prism: l = 6 cm, w = 4 cm, h = 3 cm

SECTION D: DATA HANDLING AND FINANCE (20 MARKS)

Question 8: Data (10 marks)

8.1 The test scores are: 6, 7, 8, 6, 7, 9, 10, 8, 6 (a) Mode = _____

(b) Median = _____

(c) Mean = _____

8.2 Draw a bar graph to represent the frequency of scores:



Question 9: Finance (10 marks)

9.1 Sipho earns R4 500 per month. He saves 20%. How much does he save?

9.2 A jacket costs R600. If it is marked down by 25%, what is the new price?

9.3 A loan of R1 000 is repaid with 10% interest. How much is paid back?

TOTAL: 100 MARKS



MEMO

SECTION A: WHOLE NUMBERS, INTEGERS AND EXPONENTS (25 MARKS)

Question 1: Whole Numbers and Integers (10 marks)

- 1.1) 4 000 ✓ (2)
 1.2) $9\,000 + 400 + 2$ ✓ (2)
 1.3) (a) $75 \times 13 = 975$ ✓ (2)
 (b) $221 \div 13 = 17$ ✓ (2)
 1.4) -10, -5, 0, 2, 3 ✓ (2)

Question 2: Exponents (15 marks)

- 2.1) (a) $4^2 + 2^3 = 16 + 8 = 24$ ✓ (2)
 (b) $10^2 - 3^2 = 100 - 9 = 91$ ✓ (2)
 (c) $(2^3)^2 = 8^2 = 64$ ✓ (2)
 2.2) (a) $3 \times 3 \times 3 \times 3 \times 3 = 3^5$ ✓ (2)
 (b) $5 \times 5 = 5^2$ ✓ (1)
 2.3) (a) $6^2 + 2^3 - 4 = 36 + 8 - 4 = 40$ ✓ (4)

SECTION B: ALGEBRA, EQUATIONS AND GRAPHS (30 MARKS)

Question 3: Algebraic Expressions (10 marks)

- 3.1) (a) $2x - x + 4 + 7 = x + 11$ ✓ (2)
 (b) $5(x - 1) + 3 = 5x - 5 + 3 = 5x - 2$ ✓ (2)
 3.2) (a) $6x + 12 = 6(x + 2)$ ✓ (2)
 (b) $ab + a = a(b + 1)$ ✓ (2)
 3.3) (a) $(x - 5)(x + 2) = x^2 + 2x - 5x - 10 = x^2 - 3x - 10$ ✓ (2)

Question 4: Equations (10 marks)

- 4.1) (a) $x = 14$ ✓ (1)

(b) $2(x + 1) = 12 \rightarrow x + 1 = 6 \rightarrow x = 5$ ✓ (2)

(c) $4x - 3 = x + 9 \rightarrow 3x = 12 \rightarrow x = 4$ ✓ (3)

Question 5: Graphs (10 marks)

5.1)

x -1 0 1 2 3

y -1 1 3 5 7 ✓ (5)

5.2) Line graph correctly plotted for $y = 2x + 1$ ✓ (5)

SECTION C: GEOMETRY AND MEASUREMENT (25 MARKS)

Question 6: Properties of Shapes (10 marks)

6.1) A quadrilateral is a polygon with four sides and four angles. ✓ (2)

6.2) Equilateral and scalene triangles ✓ (2)

6.3) Six lines of symmetry ✓ (2)

6.4) 540° ✓ (2)

Question 7: Area and Volume (15 marks)

7.1) Area = $\frac{1}{2} \times 8 \times 5 = 20 \text{ cm}^2$ ✓ (3)

7.2) Area = $\frac{1}{2} \times (6 + 10) \times 4 = 32 \text{ cm}^2$ ✓ (3)

7.3) Volume = $5^3 = 125 \text{ cm}^3$ ✓ (3)

7.4) Volume = $6 \times 4 \times 3 = 72 \text{ cm}^3$ ✓ (3)

SECTION D: DATA HANDLING AND FINANCE (20 MARKS)

Question 8: Data (10 marks)

8.1) (a) Mode = 6 ✓ (1)

(b) Median = 7 ✓ (2)

(c) Mean = $(6+7+8+6+7+9+10+8+6)/9 = 67 \div 9 \approx 7.44$ ✓ (3)

8.2) Bar graph with accurate frequencies and labels ✓ (4)

Question 9: Finance (10 marks)

9.1) 20% of 4 500 = $0.2 \times 4\,500 = \text{R}900$ ✓ (3)

9.2) 25% of 600 = R150 \rightarrow New price = R450 ✓ (3)

9.3) Interest = 10% of 1 000 = R100 \rightarrow Total = R1 100 ✓ (4)

✓ TOTAL: 100 MARKS

