

SMARTWIZ

GRADE 8 MATHEMATICS EXAM

MARKS: 100

MARKS

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 5 pages, excluding the cover page.

SECTION A: WHOLE NUMBERS AND EXPONENTS (25 MARKS)**Question 1: Whole Numbers (10 marks)** 1.1 Round off 5 678 to the nearest hundred.

1.2 Write the following in expanded notation: 7 204

1.3 Calculate:

(a) $125 \times 12 =$ _____

(b) $144 \div 12 =$ _____

1.4 Arrange in descending order: 3 921, 4 201, 3 999, 4 111

Question 2: Exponents (15 marks) 2.1 Simplify:

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

(b) $5^2 \times 2^3 =$ _____

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

2.2 Write in exponential form:

(a) $2 \times 2 \times 2 \times 2 =$ _____

(b) $10 \times 10 =$ _____

2.3 Simplify and show all working:

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

SECTION B: ALGEBRAIC EXPRESSIONS AND EQUATIONS (30 MARKS)**Question 3: Algebraic Expressions (15 marks)** 3.1 Simplify the following: (a) $3x + 5 - x + 2 =$

(b) $2(x - 3) + 4 =$ _____

(c) $4a + 2b - 3a + b =$ _____

3.2 Factorise: (a) $3x + 6 =$ _____

(b) $2a + 4ab =$ _____

3.3 Expand: (a) $(x + 3)(x + 2) =$ _____

Question 4: Solving Equations (15 marks) 4.1 Solve for x: (a) $x + 7 = 15$

(b) $3x - 4 = 11$

(c) $2(x - 1) = 10$

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

(e) $3x + 2 = 2x + 9$

SECTION C: GEOMETRY AND MEASUREMENT (25 MARKS)

Question 5: Perimeter and Area (15 marks) 5.1 A rectangle has a length of 12 cm and a breadth of 5 cm:

(a) Perimeter = _____

(b) Area = _____

5.2 A triangle has a base of 10 cm and height of 6 cm. Calculate the area.

5.3 A square has a perimeter of 24 cm. What is the length of one side?

5.4 A parallelogram has a base of 8 cm and height of 7 cm. Find the area.

Question 6: Volume and Surface Area (10 marks) 6.1 Volume of a cube with edge of 6 cm.

6.2 Volume of a rectangular prism with $l = 5$ cm, $b = 3$ cm, $h = 4$ cm.

6.3 Surface area of a cube with edge of 4 cm.

SECTION D: DATA HANDLING AND PROBABILITY (20 MARKS)

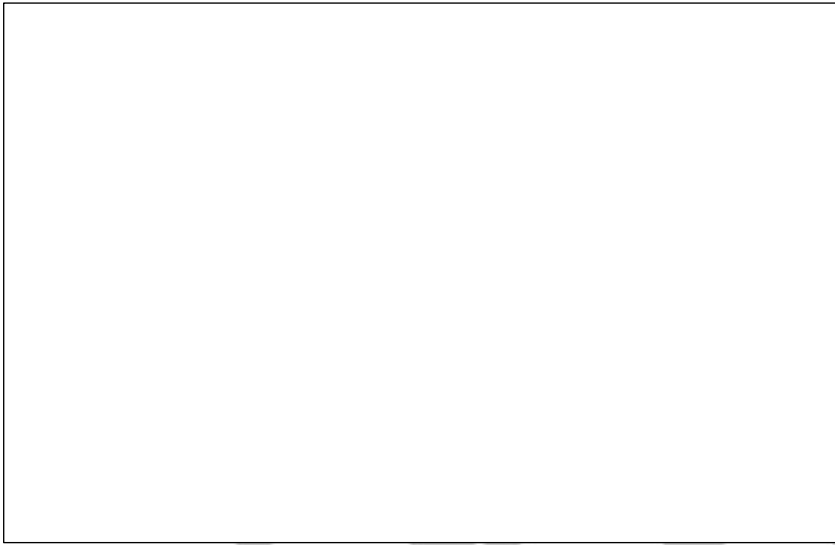
Question 7: Data and Graphs (10 marks) 7.1 The marks (out of 10) of 6 learners are: 8, 6, 7, 9, 5, 8 (a)

Find the mode: _____

(b) Find the median: _____

(c) Calculate the mean: _____

7.2 Draw a bar graph to represent the data above. Use the space below:



Question 8: Probability (10 marks) 8.1 What is the probability of: (a) Rolling an even number on a die = _____

(b) Picking a red card from a standard pack (no jokers) = _____

8.2 A bag contains 3 red, 2 blue and 5 green marbles. (a) Total number of marbles = _____

(b) Probability of drawing a blue = _____

(c) Probability of drawing a green = _____

TOTAL : 100

MEMO

SECTION A: WHOLE NUMBERS AND EXPONENTS (25 MARKS)

Question 1: Whole Numbers (10 marks)

- 1.1) 5 700 ✓ (2)
 1.2) $7\,000 + 200 + 4$ ✓ (2)
 1.3) (a) $125 \times 12 = 1\,500$ ✓ (2)
 (b) $144 \div 12 = 12$ ✓ (2)
 1.4) Descending order: 4 201, 4 111, 3 999, 3 921 ✓ (2)

Question 2: Exponents (15 marks)

- 2.1) (a) $2^3 + 3^2 = 8 + 9 = 17$ ✓ (2)
 (b) $5^2 \times 2^3 = 25 \times 8 = 200$ ✓ (2)
 (c) $(3^2)^2 = 9^2 = 81$ ✓ (2)
 2.2) (a) $2 \times 2 \times 2 \times 2 = 2^4$ ✓ (2)
 (b) $10 \times 10 = 10^2$ ✓ (1)
 2.3) (a) $3^3 - 2^2 + 4 = 27 - 4 + 4 = 27$ ✓ (4)

SECTION B: ALGEBRAIC EXPRESSIONS AND EQUATIONS (30 MARKS)

Question 3: Algebraic Expressions (15 marks)

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

Question 4: Solving Equations (15 marks)

- 4.1) (a) $x = 8$ ✓ (1)
 (b) $3x = 15 \rightarrow x = 5$ ✓ (2)
 (c) $2x - 2 = 10 \rightarrow 2x = 12 \rightarrow x = 6$ ✓ (3)
 (d) $x + 4 = 2x - 1 \rightarrow 4 + 1 = x \rightarrow x = 5$ ✓ (4)
 (e) $3x + 2 = 2x + 9 \rightarrow x = 7$ ✓ (5)

SECTION C: GEOMETRY AND MEASUREMENT (25 MARKS)

Question 5: Perimeter and Area (15 marks)

5.1) (a) Perimeter = $2(12 + 5) = 2 \times 17 = 34 \text{ cm}$ ✓ (2)

(b) Area = $12 \times 5 = 60 \text{ cm}^2$ ✓ (2)

5.2) Area = $\frac{1}{2} \times \text{base} \times \text{height} = \frac{1}{2} \times 10 \times 6 = 30 \text{ cm}^2$ ✓ (3)

5.3) Perimeter = $24 \text{ cm} \rightarrow \text{Side} = 24 \div 4 = 6 \text{ cm}$ ✓ (2)

5.4) Area = $\text{base} \times \text{height} = 8 \times 7 = 56 \text{ cm}^2$ ✓ (3)

Question 6: Volume and Surface Area (10 marks)

6.1) Volume = $6^3 = 216 \text{ cm}^3$ ✓ (3)

6.2) Volume = $5 \times 3 \times 4 = 60 \text{ cm}^3$ ✓ (3)

6.3) Surface area = $6 \times (4^2) = 6 \times 16 = 96 \text{ cm}^2$ ✓ (4)

SECTION D: DATA HANDLING AND PROBABILITY (20 MARKS)

Question 7: Data and Graphs (10 marks)

7.1) (a) Mode = 8 ✓ (1)

(b) Median = 7.5 (middle of 6 and 8) ✓ (2)

(c) Mean = $(8 + 6 + 7 + 9 + 5 + 8) \div 6 = 43 \div 6 \approx 7.17$ ✓ (3)

7.2) Bar graph drawn correctly with all values and axes labeled ✓ (4)

Question 8: Probability (10 marks)

8.1) (a) Even numbers on a die: 2, 4, 6 $\rightarrow 3/6 = 1/2$ ✓ (2)

(b) Red cards in a deck: $26/52 = 1/2$ ✓ (2)

8.2) (a) Total marbles = $3 + 2 + 5 = 10$ ✓ (1)

(b) Blue: $2/10 = 1/5$ ✓ (2)

(c) Green: $5/10 = 1/2$ ✓ (3)

✓ TOTAL: 100 MARKS

MAP

MYST PATHWORKS

IVII