

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: FRACTIONS, DECIMALS & RATIO (30 MARKS)

Question 1: Working with Fractions (10 Marks)

1.1) Simplify:

$$34 + 25 = \frac{3}{4} + \frac{2}{5} = 43 + 52 =$$

1.2) Subtract:

$$78 - 13 = \frac{7}{8} - \frac{1}{3} = 87 - 31 =$$

1.3) Multiply:

$$56 \times 23 = \frac{5}{6} \times \frac{2}{3} = 65 \times 32 =$$

1.4) Divide:

$$45 \div 27 = \frac{4}{5} \div \frac{2}{7} = 54 \div 72 =$$

1.5) Convert the answer of 1.4 to a mixed number:

Question 2: Decimals and Percentages (10 Marks)

2.1) Convert:

a) 0.75 to a fraction = _____

b) 65% to a decimal = _____

2.2) A student scored 36 out of 60 in a test. What percentage is this?

2.3) Increase R240 by 25%:

2.4) A jacket was on sale for 15% off. The original price was R800. What is the discount amount and the final price?

Discount = _____ Final Price = _____

Question 3: Ratio and Rate (10 Marks)

3.1) Simplify the ratio: 18:24

3.2) In a class of 36 learners, 20 are girls. Write the ratio of girls to boys.

3.3) If 3 pens cost R18, what is the cost of 7 pens?

3.4) A car travels 180 km in 3 hours. What is the average speed?

SECTION B: DATA HANDLING & GRAPHS (30 MARKS)

Question 4: Interpreting a Pie Chart (10 Marks)

Pie chart: Favourite Sports of Grade 8 Learners

- Soccer – 30%
- Netball – 25%
- Athletics – 20%
- Cricket – 15%
- Rugby – 10%

4.1) How many learners chose netball if there are 80 learners?

4.2) Which sport is least popular?

4.3) What is the total percentage for soccer and rugby combined?

4.4) Draw and label your own pie chart using this data.



Question 5: Drawing and Reading Line Graphs (10 Marks)

The table below shows the temperature over 6 days:



Day	Mon	Tue	Wed	Thu	Fri	Sat
Temp (°C)	18	20	22	21	19	17

5.1) On which day was it the warmest?

5.2) What is the temperature difference between Tuesday and Saturday?

5.3) Draw a line graph.

 (Use space below – mark axes and plot correctly)

Question 6: Organising Data (10 Marks)

6.1) The marks of 10 learners out of 10:

7, 9, 6, 8, 7, 5, 6, 9, 10, 8

a) Arrange in ascending order:

b) Find the mode:

c) Find the median:

d) Calculate the mean (average):

SECTION C: GEOMETRY & CONSTRUCTION (40 MARKS)

Question 7: Properties of Shapes (10 Marks)

Look at the figure: A regular pentagon

7.1) How many sides does it have?

7.2) How many lines of symmetry does it have?

7.3) Name one property of all regular polygons.

7.4) Calculate the interior angle of the regular pentagon.
(Use formula: $(n-2) \times 180 \div n$ or $(n-2) \times 180 \div n$)

Question 8: Measuring and Constructing (15 Marks)

8.1) Use a protractor to draw:

- a) An angle of 60°
- b) An angle of 120°

(Space provided below – learners to draw)



8.2) Draw a triangle with sides: 5 cm, 6 cm, and 7 cm



8.3) Label the triangle and mark the longest side.



Question 9: Area & Volume (15 Marks)

9.1) Area of triangle with base 10 cm and height 8 cm:

Area =

9.2) Volume of a cube with side 4 cm:

Volume =

9.3) Find the area of a trapezium:

Base 1 = 6 cm, Base 2 = 10 cm, Height = 5 cm

Area =

TOTAL : 100



MEMO

SECTION A: FRACTIONS, DECIMALS & RATIO (30 MARKS)

Question 1: Working with Fractions (10 Marks)

1.1)
 $34 + 25 = 15 + 820 = 2320 = 1320$
 $\frac{3}{4} + \frac{2}{5} = \frac{15 + 8}{20} = \frac{23}{20} = 1$
 $\frac{3}{20} + \frac{2}{10} = \frac{3 + 4}{20} = \frac{7}{20}$ ✓ (2)

1.2)
 $78 - 13 = 21 - 824 = 1324$
 $\frac{7}{8} - \frac{1}{3} = \frac{21 - 8}{24} = \frac{13}{24}$
 $87 - 31 = 2421 - 8 = 2413$ ✓ (2)

1.3)
 $56 \times 23 = 1018 = 59$
 $\frac{5}{6} \times \frac{2}{3} = \frac{10}{18} = \frac{5}{9}$
 $65 \times 32 = 1810 = 95$ ✓ (2)

1.4)
 $45 \div 27 = 45 \times 72 = 2810 = 145$
 $\frac{4}{5} \div \frac{2}{7} = \frac{4}{5} \times \frac{7}{2} = \frac{28}{10} = \frac{14}{5}$
 $54 \div 72 = 54 \times 27 = 1028 = 514$ ✓ (2)

1.5)
 $145 = 245$
 $\frac{14}{5} = 2 \frac{4}{5}$
 $514 = 254$ ✓ (2)

Question 2: Decimals and Percentages (10 Marks)

2.1)
 a) $0.75 = \frac{3}{4}$
 $0.75 = \frac{3}{4}$ ✓ (1)
 b) $65\% = 0.65$
 $65\% = 0.65$ ✓ (1)

2.2)
 $360 \times 100 = 60\%$
 $\frac{36}{60} \times 100 = 60\%$ ✓ (2)

2.3)
 $25\% \text{ of } R240 = R60 \rightarrow R240 + R60 = R300$ ✓ (2)

2.4)
 $15\% \text{ of } R800 = R120$
 $\text{Final price} = R800 - R120 = R680$ ✓ (4)

Question 3: Ratio and Rate (10 Marks)

3.1)

$18:24 \rightarrow$ divide both by 6 $\rightarrow 3:4$ ✓ (2)

3.2)

Girls = 20, Boys = 16 \rightarrow Ratio = $20:16 = 5:4$ ✓ (2)

3.3)

$R18 \div 3 = R6 \rightarrow 7 \times R6 = R42$ ✓ (3)

3.4)

$180 \text{ km} \div 3 \text{ h} = 60 \text{ km/h}$ ✓ (3)

SECTION B: DATA HANDLING & GRAPHS (30 MARKS)

Question 4: Interpreting a Pie Chart (10 Marks)

4.1)

25% of 80 = 20 learners ✓ (2)

4.2)

Rugby ✓ (1)

4.3)

$30\% + 10\% = 40\%$ ✓ (1)

4.4)

Pie chart: Accept if accurately drawn with correct proportions (angles) and labels ✓ (6)

Question 5: Drawing and Reading Line Graphs (10 Marks)

5.1)

Wednesday (22°C) ✓ (1)

5.2)

$20^{\circ}\text{C} - 17^{\circ}\text{C} = 3^{\circ}\text{C}$ ✓ (1)

5.3)

Line graph correctly plotted:

- Axes labeled
 - Points plotted correctly
 - Lines drawn neatly
- ✓ (8)

Question 6: Organising Data (10 Marks)

Data: 7, 9, 6, 8, 7, 5, 6, 9, 10, 8

6.1)

Ascending: 5, 6, 6, 7, 7, 8, 8, 9, 9, 10 ✓ (2)

6.2)

Mode = 6, 7, 8, 9 (multi-modal) ✓ (1)

6.3)

Median = $(7 + 8)/2 = 7.5$ ✓ (2)

6.4)

Mean = $(\text{sum of all} = 75) \div 10 = 7.5$ ✓ (5)

SECTION C: GEOMETRY & CONSTRUCTION (40 MARKS)

Question 7: Properties of Shapes (10 Marks)

7.1) 5 sides ✓ (1)

7.2) 5 lines of symmetry ✓ (1)

7.3) All sides and angles are equal ✓ (2)

7.4)

$(5-2) \times 180 \div 5 = 3 \times 180 \div 5 = 540 \div 5 = 108^\circ$ $(5-2) \times 180 \div 5 = 3 \times 180 \div 5 = 540 \div 5 =$

108° $(5-2) \times 180 \div 5 = 3 \times 180 \div 5 = 540 \div 5 = 108^\circ$ ✓ (6)

Question 8: Measuring and Constructing (15 Marks)

8.1)

- Angle of 60° = accurate with protractor ✓ (2)
- Angle of 120° = accurate with protractor ✓ (2)

8.2)

Triangle with sides 5 cm, 6 cm, 7 cm (neatly drawn) ✓ (5)

8.3)

Labelled triangle with longest side (7 cm) marked ✓ (6)

Question 9: Area & Volume (15 Marks)

9.1)

Area = $12 \times 10 \times 8 = 40 \text{ cm}^2$ $\frac{1}{2} \times 10 \times 8 = 40$ ✓ (5)

9.2)

$$\text{Volume} = 4^3 = 64 \text{ cm}^3 \quad \checkmark \quad (5)$$

9.3)

$$\text{Area} = \frac{1}{2} \times (6 + 10) \times 5 = \frac{1}{2} \times 16 \times 5 = 40 \text{ cm}^2 \quad \checkmark \quad (5)$$

✓ TOTAL = 100 MARKS

