GRADE 10 CORE MATHEMATICS
MID TERM 2 EXAM 2026
MARKING SCHEME

SECTION A: 40 MARKS

Question 1: Simplify: $(2x^2y)(3xy^3)$

[4 marks marks]

$(2x^2y)(3xy^3)$

$= 2 \times 3 \times x^2 \times x \times y \times y^3$

$= 6 \times x^{(2+1)} \times y^{(1+3)}$

$= 6x^3y^4$

✓ **Final answer: $6x^3y^4$ (4 marks)**

Question 2: Solve: $3(2x - 5) = 4x + 7$

[4 marks marks]

$3(2x - 5) = 4x + 7$

$6x - 15 = 4x + 7$ [1 mark - expanding]

$6x - 4x = 7 + 15$ [1 mark - collecting like terms]

$2x = 22$ [1 mark - simplifying]

$x = 11$ [1 mark - solution]

✓ **Check: $3(2(11) - 5) = 3(22 - 5) = 3(17) = 51$; $4(11) + 7 = 44 + 7 = 51$ ✓**

Question 3: A number increased by 20% to give 96. Find the original number.

[4 marks marks]

Let the original number = x [1 mark - set up variable]

20% of x = 0.2x

$x + 0.2x = 96$ [1 mark - setting up equation]

$1.2x = 96$ [1 mark - simplifying]

$x = 96 \div 1.2$

$x = 80$ [1 mark - solution]

✓ **Check: 80 + 20% of 80 = 80 + 16 = 96 ✓**

Question 4: Evaluate: $2^3 \times 2^5 \div 2^4$

[4 marks marks]

Using law of indices: $a^m \times a^n = a^{m+n}$ and $a^m \div a^n = a^{m-n}$

$2^3 \times 2^5 \div 2^4$

$= 2^{(3+5-4)}$ [2 marks - applying law of indices]

$= 2^4$ [1 mark - simplifying exponent]

$= 16$ [1 mark - final answer]

Question 5: Factorize completely: $x^2 - 9x + 20$

[4 marks marks]

We need two numbers that:

• Multiply to give 20

• Add to give −9

Those numbers are −4 and −5 [1 mark - identifying factors]

$x^2 - 9x + 20 = (x - 4)(x - 5)$ [2 marks - factorisation]

✓ Check: $(x - 4)(x - 5) = x^2 - 5x - 4x + 20 = x^2 - 9x + 20$ ✓ [1 mark - verification]

Question 6: Triangle with sides 6 cm, 8 cm, 10 cm. Is it right-angled?

[4 marks marks]

For a right-angled triangle, Pythagorean theorem states:

(Longest side)² = (Other side)² + (Other side)²

Check: $10^2 = 6^2 + 8^2$ [1 mark - setting up check]

$100 = 36 + 64$

$100 = 100$ ✓ [2 marks - calculation]

Yes, the triangle is right-angled.

✓ Reason: The Pythagorean theorem is satisfied. [1 mark - conclusion and reason]

Question 7: Simplify the ratio 24:36:60

[4 marks marks]

Find the HCF (Highest Common Factor) of 24, 36, and 60

$24 = 2^3 \times 3$ [1 mark - prime factorisation]

$36 = 2^2 \times 3^2$

$60 = 2^2 \times 3 \times 5$

HCF $= 2^2 \times 3 = 12$ [1 mark - finding HCF]

24:36:60 = 24÷12 : 36÷12 : 60÷12 [1 mark - dividing by HCF]

= 2:3:5 [1 mark - final answer]

Question 8: Machine gives 15% loss. Cost price Sh 2,000. Find selling price.

[4 marks marks]

Cost Price (CP) = Sh 2,000 [1 mark]

Loss = 15% of CP

Loss = 15% × 2,000 [1 mark - calculating loss]
= 0.15 × 2,000
= Sh 300
Selling Price = CP − Loss [1 mark - using formula]
= 2,000 − 300
= Sh 1,700 [1 mark - final answer]

Question 9: Average of 6, 8, 10, x and 14 is 10. Find x.

[4 marks marks]

Average = Sum of values / Number of values [1 mark - formula]
10 = (6 + 8 + 10 + x + 14) / 5
10 = (38 + x) / 5 [1 mark - summing known values]
10 × 5 = 38 + x [1 mark - multiplying both sides by 5]
50 = 38 + x
x = 50 − 38
x = 12 [1 mark - solution]
✓ Check: (6 + 8 + 10 + 12 + 14) / 5 = 50 / 5 = 10 ✓

Question 10: Class has 12 boys and 18 girls. Probability of selecting a boy.

[4 marks marks]

Total students = 12 + 18 = 30 [1 mark - total]
Number of boys = 12 [1 mark]
Probability = Favourable outcomes / Total outcomes
P(boy) = 12/30 [1 mark - setting up probability]
= 2/5 or 0.4 or 40% [1 mark - simplifying]

SECTION B: 60 MARKS

Students should answer any 5 questions from this section

Question 11: Simultaneous Equations and Linear Expression

[6 marks marks]

(a) Solve: $2x + y = 11$ and $x - y = 1$

From the second equation: $x - y = 1$

$x = y + 1$ [1 mark - rearranging]

Substitute into first equation:

$2(y + 1) + y = 11$ [1 mark - substituting]

$2y + 2 + y = 11$

$3y + 2 = 11$ [1 mark - simplifying]

$3y = 9$

$y = 3$ [1 mark - solving for y]

$x = y + 1 = 3 + 1 = 4$ [1 mark - solving for x]

✓ Verification: $2(4) + 3 = 11$ ✓ and $4 - 3 = 1$ ✓

(b) Find the value of $3x - 2y$

$3x - 2y = 3(4) - 2(3)$ [0.5 marks - substituting values]

$= 12 - 6$

$= 6$ [0.5 marks - final answer]

Question 12: Triangle on Cartesian Plane

[6 marks marks]

(a) Plot the triangle on a Cartesian plane

Triangle PQR with P(1,2), Q(5,2), and R(5,6) plotted correctly

✓ Diagram showing correct coordinates and triangle shape (2 marks)

(b) Find the area of triangle PQR

From coordinates: P(1,2), Q(5,2), R(5,6)

Base PQ is horizontal from (1,2) to (5,2)

Length of base = $5 - 1 = 4$ units [1 mark]

Height = perpendicular distance from R to PQ

Height = $6 - 2 = 4$ units [1 mark]

Area = $1/2 \times$ base $\times$ height [1 mark - formula]

$= 1/2 \times 4 \times 4$

$= 1/2 \times 16$

$= 8$ square units [1 mark - final answer]

Question 13: Rectangular Field - Perimeter and Area

[6 marks marks]

(a) Find the perimeter

Length (L) = 60 m, Width (W) = 35 m

Perimeter = 2(L + W) [1 mark - formula]

= 2(60 + 35)

= 2(95)

= 190 m [1 mark - final answer]

(b) Find the area in m² and hectares

Area = L × W [1 mark - formula]

= 60 × 35

= 2,100 m² [1 mark - in square meters]

Converting to hectares:

1 hectare = 10,000 m² [1 mark - conversion factor]

Area = 2,100 ÷ 10,000

= 0.21 hectares [1 mark - in hectares]

Question 14: Right-angled Triangle - Area and Hypotenuse

[6 marks marks]

(a) Find the area

Base = 12 cm, Height = 5 cm

Area = 1/2 × base × height [1 mark - formula]

= 1/2 × 12 × 5

= 6 × 5

= 30 cm² [1 mark - final answer]

(b) Find the length of the hypotenuse

Using Pythagorean theorem: $c^2 = a^2 + b^2$ [1 mark - formula]

$c^2 = 12^2 + 5^2$

$c^2 = 144 + 25$ [1 mark - squaring]

$c^2 = 169$ [1 mark - adding]

$c = \sqrt{169}$

c = 13 cm [1 mark - final answer]

Question 15: Circular Garden - Circumference and Area

[6 marks marks]

(a) Find the circumference

Radius (r) = 7 m

Circumference = $2\pi r$ [1 mark - formula]

$= 2 \times 22/7 \times 7$

$= 2 \times 22 \times (7/7)$

$= 2 \times 22$

$= 44$ m [1 mark - final answer]

(b) Find the area (Use $\pi = 22/7$)

Area = πr^2 [1 mark - formula]

$= 22/7 \times 7^2$

$= 22/7 \times 49$ [1 mark - squaring radius]

$= (22 \times 49) / 7$

$= 22 \times (49/7)$ [1 mark - simplifying]

$= 22 \times 7$

$= 154$ m² [1 mark - final answer]

Question 16: Map Scale and Speed Calculation

[6 marks marks]

(a) Find the actual distance between the towns

Map scale: 1 cm represents 5 km

Distance on map = 8.4 cm

Actual distance = 8.4×5 [1 mark - using scale]

$= 42$ km [1 mark - calculation]

✓ **Final answer: 42 km (3 marks total for part a)**

(b) Time taken at 60 km/h

Time = Distance / Speed [1 mark - formula]

$= 42 / 60$

$= 0.7$ hours [1 mark - calculation]

Converting to minutes: $0.7 \times 60 = 42$ minutes

✓ **Final answer: 0.7 hours or 42 minutes (3 marks total for part b)**

Question 17: Probability with Colored Balls

[6 marks marks]

(a) Probability of picking a blue ball

Total balls = 5 + 3 + 2 = 10 balls [1 mark - counting total]

Blue balls = 3

P(blue) = 3/10 [1 mark - probability]

(b) Probability of picking a red or green ball

Red balls = 5, Green balls = 2

Red or green = 5 + 2 = 7 balls [1 mark - counting favorable outcomes]

P(red or green) = 7/10 [2 marks - probability and answer]

✓ **Alternative: P(red or green) = 1 − P(blue) = 1 − 3/10 = 7/10**

Question 18: Measures of Central Tendency

[6 marks marks]

Data: 2, 3, 4, 4, 5, 6, 6, 6, 7

(a) Find the mode

Mode = most frequently occurring value

Value 6 appears 3 times (more than any other)

✓ **Mode = 6 (1 mark)**

(b) Find the median

Data in order: 2, 3, 4, 4, 5, 6, 6, 6, 7

Number of values = 9 (odd number) [1 mark]

Median position = (9 + 1) / 2 = 5th value [1 mark]

Median = 5 [counting]

✓ **Median = 5 (2 marks total)**

(c) Find the mean

Mean = Sum of values / Number of values [1 mark - formula]

Sum = 2 + 3 + 4 + 4 + 5 + 6 + 6 + 6 + 7

= 43 [1 mark - calculating sum]

Mean = 43 / 9

= 4.78 (to 2 d.p.) or $4\frac{7}{9}$ (as fraction)

✓ **Mean = 4.78 or 43/9 (3 marks total for part c)**