Mathematics – Model Answer Key & Rubrics

Reference solutions and detailed marking scheme — step marks shown

Q1. Simplify: 3x + 4x - 5 + 7

Model Answer: 7x + 2

Steps: Combine like terms: 3x + 4x = 7x; combine constants: -5 + 7 = 2 → 7x + 2.

Rubric:

- 2 marks for correctly combining like terms (3x + 4x → 7x).
- 1 mark for correct simplification of constants (-5 + 7 → 2) and final expression.

Total: Total: 3 marks

Q2. Solve for x: 2x + 3 = 11

Model Answer: x = 4

Steps: 2x + 3 = 11 → subtract 3 from both sides: 2x = 8 → divide by 2: x = 4.

Common student mistakes: Arithmetic slip leading to x = 5 (as in sample student sheet).

Rubric:

- 1 mark for correctly subtracting 3 (2x = 8).
- 1 mark for dividing by 2 correctly (x = 4).
- 1 mark for final correct answer.

Total: Total: 3 marks

Q3. Find the area of a circle with radius 7 cm.

Model Answer: 153.86 cm² (using π ≈ 3.14)

Steps: Area = πr². Substitute r = 7: A = 3.14 × 7 × 7 = 3.14 × 49 = 153.86 cm².

Common student mistakes: Student used radius 6 by mistake — intentionally wrong.

Rubric:

- 2 marks for stating correct formula A = πr².
- 2 marks for correct substitution (3.14 × 7 × 7).
- 1 mark for correct numeric result (153.86 rounded to two decimal places).

Total: Total: 5 marks

Q4. Define Pythagoras theorem.

Model Answer: In a right-angled triangle, the square of the hypotenuse equals the sum of the squares of the other two sides.

Steps: Short statement suffices. Example: $c^2 = a^2 + b^2$.

Rubric:

- 2 marks for a correct formal statement.
- 1 mark for clarity/conciseness (correct notation or example).

Total: Total: 3 marks

Q5. Evaluate: $(5^2 + 3^2) \div 4$

Model Answer: 8.5

Steps: $5^2 = 25$; $3^2 = 9$; sum = 34; divide by 4 $\rightarrow$ $34 \div 4 = 8.5$.

Common student mistakes: Student mis-divided — intentionally wrong.

Rubric:

- 2 marks for correctly computing the squares (25 and 9).
- 1 mark for performing the addition (34).
- 1 mark for dividing correctly to get final result (8.5).

Total: Total: 4 marks

Q6. If a train travels 120 km in 2 hours, find its speed.

Model Answer: 60 km/hr

Steps: Speed = Distance / Time = 120 km / 2 hr = 60 km/hr.

Rubric:

- 1 mark for stating formula Speed = Distance / Time.
- 2 marks for correct substitution/working.
- 1 mark for giving the correct units (km/hr).

Total: Total: 4 marks