

Cambridge Lower Secondary Checkpoint style: Stage 9 maths practice, 20 questions with answers

Written by Science with Shobha in the style of the test; these are not Cambridge questions. 40 minutes. Show your working: method earns marks. Marks are in brackets (total 38).

Part 1: no calculator

1. Work out $\frac{3}{4} + \frac{2}{5}$. Give your answer as a mixed number. [2]
2. Write 0.00047 in standard form. [1]
3. Simplify $3a^2 \times 4a^3$. [1]
4. Solve $5x - 7 = 2x + 11$. [2]
5. Expand and simplify $(x + 3)(x - 5)$. [2]
6. Find the n th term of the sequence 7, 11, 15, 19, ... [2]
7. The angles of a triangle are x , $2x$ and $3x$. Find the value of x . [2]
8. Work out $2^3 \times 2^{-5}$. Give your answer as a fraction. [2]
9. A bag holds 3 red, 5 blue and 2 green counters. One is taken at random. Find the probability that it is not blue. [1]
10. Factorise fully $6x^2 - 9x$. [2]

Part 2: calculator allowed

11. A right-angled triangle has shorter sides 6 cm and 8 cm. Find the length of the hypotenuse. [2]
12. Increase 240 by 15%. [2]
13. Solve the simultaneous equations $2x + y = 11$ and $x - y = 1$. [3]
14. A car travels 150 km in 2.5 hours. Find its average speed. [1]
15. A circle has radius 7 cm. Find its area, correct to 1 decimal place. [2]
16. For the numbers 4, 7, 7, 9, 13 find the mean and the median. [2]
17. A straight line passes through (0, 3) and (2, 7). Find its equation. [2]
18. A cuboid measures 5 cm by 4 cm by 3 cm. Find its volume and its total surface area. [3]
19. Rearrange $v = u + at$ to make t the subject. [2]
20. Share 180 in the ratio 2 : 3 : 4. [2]

Notation: a^2 means a squared; 2^{-5} means 2 to the power -5.

Answers with working

Part 1

1. $15/20 + 8/20 = 23/20 = 1 \frac{3}{20}$ (1 mark for a common denominator)
2. 4.7×10^{-4}
3. $12a^5$ (multiply the numbers, add the powers)
4. $3x = 18$, so $x = 6$ (1 mark for collecting terms)
5. $x^2 - 5x + 3x - 15 = x^2 - 2x - 15$
6. Goes up in 4s: $4n$. First term $7 = 4 + 3$, so $4n + 3$
7. $x + 2x + 3x = 180$, $6x = 180$, $x = 30$
8. $2^{(3-5)} = 2^{-2} = 1/4$
9. 5 of the 10 are not blue: $5/10 = 1/2$
10. $3x(2x - 3)$ ($3(2x^2 - 3x)$ or $x(6x - 9)$ earns 1 mark: not fully factorised)

Part 2

11. $6^2 + 8^2 = 36 + 64 = 100$; square root of 100 = 10 cm
12. $240 \times 1.15 = 276$ (or 15% of 240 = 36; $240 + 36$)
13. Add the equations: $3x = 12$, $x = 4$. Then $4 - y = 1$, $y = 3$. Check: $2(4) + 3 = 11$
14. $150 / 2.5 = 60$ km/h
15. $\pi \times 7^2 = 153.938\dots$; 153.9 cm²
16. Mean = $40 / 5 = 8$. Median = 7 (the middle value)
17. Gradient = $(7 - 3) / (2 - 0) = 2$; intercept 3; $y = 2x + 3$
18. Volume = $5 \times 4 \times 3 = 60$ cm³. Surface area = $2(20 + 15 + 12) = 94$ cm²
19. $v - u = at$, so $t = (v - u) / a$
20. 9 parts; $180 / 9 = 20$ per part; 40, 60 and 80

Reading the result

Sort every lost mark into one of three piles: (1) did not know the topic, (2) knew it and slipped, (3) did not understand what the question wanted. Pile 1: learn the topic. Pile 2: slow down and check. Pile 3: practise the command words (show that, explain, give a reason). Then rework each lost mark the next day on a clean page. Strands: Q1-3, 8, 12, 20 number; Q4-6, 10, 13, 17, 19 algebra; Q7, 11, 15, 18 geometry and measure; Q9, 16 statistics and probability; Q14 measure.

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