

IBSMO

International British Science & Mathematics Olympiad

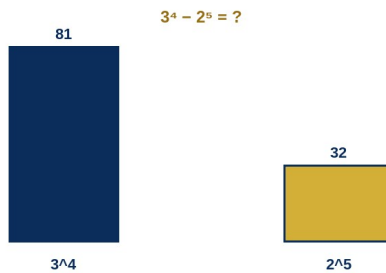
Mathematics — Sample Questions

Advanced Level

Grade 7–8

Question 1 — Number Theory

The diagram below compares 3^4 and 2^5 as bar heights.



What is the value of $3^4 - 2^5$?

- A) 39
- B) 43
- C) 49 ✓
- D) 55

Answer: C. $3^4 = 81$ and $2^5 = 32$, so $81 - 32 = 49$.

Question 2 — Algebra

The diagram below shows the equation $3(2x - 1) = 5x + 4$.

$$\boxed{3 \times (2x - 1)} = \boxed{5x + 4}$$

Solve for x

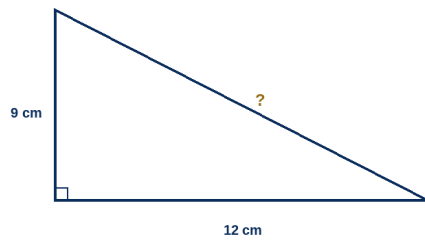
What is the value of x ?

- A) 5
- B) 6
- C) 7 ✓
- D) 8

Answer: C. $3(2x - 1) = 5x + 4 \rightarrow 6x - 3 = 5x + 4 \rightarrow x = 7$.

Question 3 — Geometry

The right triangle below has the two legs shown.



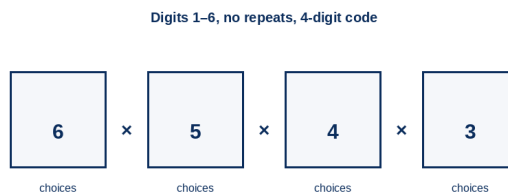
What is the length of the hypotenuse?

- A) 13 cm
- B) 14 cm
- C) 15 cm ✓
- D) 16 cm

Answer: C. By the Pythagorean theorem, $\sqrt{(9^2 + 12^2)} = \sqrt{(81 + 144)} = \sqrt{225} = 15$ cm.

Question 4 — Logical Thinking

A 4-digit code is created using the digits 1–6, with no digit repeated, as shown in the diagram below.



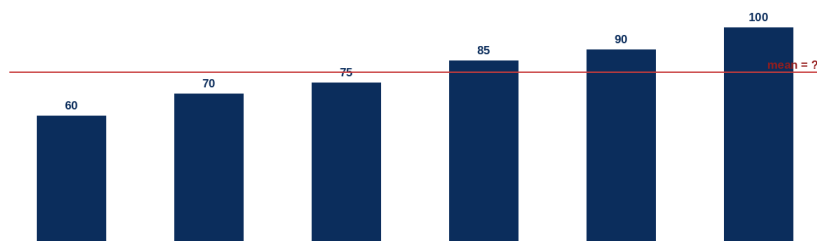
How many different 4-digit codes are possible?

- A) 120
- B) 240
- C) 360 ✓
- D) 720

Answer: C. This is a permutation: $6 \times 5 \times 4 \times 3 = 360$.

Question 5 — Data Analysis

The bar chart below shows six students' test scores.



What is the mean (average) of the six scores?

- A) 76
- B) 78
- C) 80 ✓

D) 82

Answer: C. $Sum = 60+70+75+85+90+100 = 480$; $mean = 480 \div 6 = 80$.