

YOU & MATHS Cindy was asked by her teacher to subtract 3 from a certain number and then divide the result by 9. Instead, she subtracted 9 and then divided the result by 3, giving an answer of 43. What would her answer have been had she worked out the problem correctly?

- ☐ A 15 ☐ B 34 ☐ C 43 ☐ D 51 ☐ E 138

(USA American Mathematics Contest 10, AMC 10, Sample Questions, 2002)

Let's translate the operations into mathematical language, calling x the *certain number*:

The teacher asked to Cindy to:

subtract 3 from a certain number:

$$x - 3;$$

then divide the result by 9:

$$\frac{x - 3}{9}.$$

Instead, Cindy:

subtracted 9 from a certain number:

$$x - 9;$$

then divided the result by 3:

$$\frac{x - 9}{3};$$

giving an answer of 43:

$$\frac{x - 9}{3} = 43.$$

Thus we obtain the equation:

$$\frac{x - 9}{3} = 43.$$

Let's solve the equation:

$$x - 9 = 43 \cdot 3 \rightarrow x = 138.$$

Performing the operations required by the teacher, we get:

$$\frac{138 - 3}{9} = \frac{135}{9} = 15,$$

that is, answer A.