Squares and Cubes

PR05-V1 · storyboard · PR05 Squares and cubes in a proportion. Read each picture with its sentences.

Picture 1

a and b^2 are directly proportional, and $a = 5$ when $b = 9$. Find a when $b = 12$.

$$\frac{a}{b^2} = \frac{5}{81} \qquad 9^2 = 81$$

$$\boxed{a = 144 \times \frac{5}{81} = \frac{80}{9}}$$

1. a and b squared are directly proportional, and a is 5 when b is 9.
2. Find a when b is 12.
3. Square b first: 9 squared is 81.
4. So a over b squared is 5 over 81.
5. 12 squared is 144, so a is 144 times 5 over 81, which is 80 over 9.

Picture 2

Trap $a \propto b^2$

$$\times \quad \frac{a}{12} = \frac{5}{9}$$

$$\checkmark \quad \frac{a}{144} = \frac{5}{81}$$

6. Watch for the trap: using the number instead of its square.
7. Use 144, not 12.

Picture 3

y and x^2 are inversely proportional, and $y = 9$ when $x = 2$. Find x when $y = 4$.

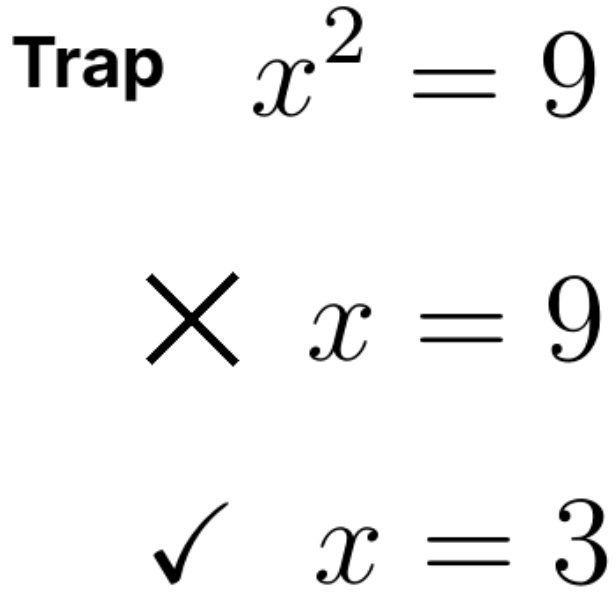
$$yx^2 = 9 \times 4 = 36$$

$$4x^2 = 36, \quad x^2 = 9$$

$$\boxed{x = 3}$$

8. y and x squared are inversely proportional, and y is 9 when x is 2.
9. Find x when y is 4.
10. The product stays the same: y times x squared is 9 times 4, that is 36.
11. So 4 x squared is 36, and x squared is 9.
12. Take the square root: x is 3.

Picture 4



13. Watch for the second trap: forgetting the root.
14. 9 is x squared, not x.