The Ratio Stays the Same

PR01-V1 · storyboard · PR01 Direct proportion. Read each picture with its sentences.

Picture 1

30 litres of petrol cost $\$48$. How much do 45 litres cost?

$$45 \div 30 = 1.5$$ how many times as much petrol

$$\boxed{48 \times 1.5 = 72}$$ dollars

1. 30 litres of petrol cost 48 dollars.
2. How much do 45 litres cost?
3. 45 litres is 1.5 times 30 litres.
4. So multiply the cost too: 48 times 1.5 is 72 dollars.

Picture 2

Trap $30 \rightarrow 45$ litres

$\times \quad 48 + 15 = 63$

$\checkmark \quad 48 \times 1.5 = 72$

5. Watch for the trap: adding.
6. 15 more litres doesn't mean 15 more dollars.
7. A proportion multiplies.

Picture 3

a and b are directly proportional, and $a = 5$ when $b = 9$. Find b when $a = 14$.

$$\frac{14}{b} = \frac{5}{9}$$ a on top on both sides

$$5b = 126$$

$$\boxed{b = 25.2}$$

8. a and b are directly proportional, and a is 5 when b is 9.
9. Find b when a is 14.
10. The ratio stays the same: a on top on both sides.
11. 14 over b equals 5 over 9.
12. Cross-multiply: 5 b equals 126.
13. So b is 25.2.

Picture 4

Trap $\dfrac{14}{b} = \dfrac{5}{9}$

$\times$ $\dfrac{14}{b} = \dfrac{9}{5}$

✓ $\dfrac{14}{b} = \dfrac{5}{9}$

14. Watch for the second trap: one ratio upside down.
15. Keep the same order on both sides.