# Direct proportion: y = kx

**1**

$y$ is directly proportional to $x$.
When $x = 4$, $y = 12$. Write a formula for $y$ in terms of $x$.

$y \propto \square x \qquad y = k \square x$

$\square = k \times \square$

$k = \frac{\square}{\square} = \square$

$y = \square x$

**2**

$y$ is directly proportional to $x$.
When $x = 5$, $y = 35$. Write a formula for $y$ in terms of $x$.

$y \propto \square x \qquad y = k \square x$

$\square = k \times \square$

$k = \frac{\square}{\square} = \square$

$y = \square x$

**3**

$A$ is directly proportional to $r$.
When $r = 6$, $A = 54$. Write a formula for $A$ in terms of $r$.

$A \propto \square \qquad A = k \square$

$\square = k \times \square$

$k = \frac{\square}{\square} = \square$

$A = \square r$

**4** *Notice the change!*

$y$ is directly proportional to $x$.
When $x = 3$, $y = 18$. Find $y$ when $x = 7$.

$y \propto \square x \qquad y = k \square x$

$\square = k \times \square$

$k = \frac{\square}{\square} = \square$

$y = \square x$

$y = \square \times \square = \square$

**5**

$y$ is directly proportional to $x$.
When $x = 8$, $y = 40$. Find $y$ when $x = 11$.

$y \propto \square \qquad y = k \square$

$\square = k \times \square$

$k = \frac{\square}{\square} = \square$

$y = \square x$

$y = \square \times \square = \square$

**6**

$P$ is directly proportional to $Q$.
When $Q = 7$, $P = 28$. Find $P$ when $Q = 9$.

$P =$ _____

**7** *Notice the change!*

$y$ is directly proportional to $x$.
When $x = 2$, $y = 16$. Find $x$ when $y = 56$.

$y \propto \square x \qquad y = k \square x$

$\square = k \times \square$

$k = \frac{\square}{\square} = \square$

$y = \square x$

$\square = \square \times x$

$x = \frac{\square}{\square} = \square$

**8**

The cost, $C$ pounds, of concert tickets is directly proportional to the number of tickets, $n$. 5 tickets cost £30.
How many tickets cost £72?

Answer _____

# Direct proportion: y = kx *further practice*

**9**

$y$ is directly proportional to $x$.
When $x = 6$, $y = 54$. Find $y$ when $x = 4$.

Answer _____

**10**

$y$ is directly proportional to $x$.
When $x = 4$, $y = 10$. Find $y$ when $x = 6$.

Answer _____

**11**

Is $y$ directly proportional to $x$?
Show how you know.

| $x$ | 2 | 5 | 7 |
|---|---|---|---|
| $y$ | 8 | 20 | 30 |

Answer _____

**12**

The distance, $d$ km, a cyclist rides is directly proportional to the time, $t$ hours. She rides 45 km in 3 hours.
How far does she ride in 5 hours?

Answer _____

**13**

$y$ is directly proportional to $x$.
When $x = 6$, $y = 9$. Find $x$ when $y = 24$.

Answer _____

**14**

The mass, $m$ grams, of a piece of wire is directly proportional to its length, $L$ cm. 20 cm of wire has a mass of 50 g.
How long is a piece with a mass of 175 g?

Answer _____

**15**

$y$ is directly proportional to $x$.
When $x = 5$, $y = 20$. Sam says that when $x = 8$, $y = 23$, because $x$ went up by 3.
Explain Sam's mistake and find the right value of $y$.

Answer _____

**16**

$y$ is directly proportional to $x$.
When $x = 6$, $y = 15$. Find the value of $x$ for which $y$ is 21 more than $x$.

Answer _____