Direct and Inverse Proportion

GCSE Maths · Higher tier · Grades 5–7 · About 25 minutes · 8 questions

Name _____ Date _____ Score / 8

WHAT YOU WILL PRACTISE

- Write and use a formula for direct proportion
- Write and use a formula for inverse proportion
- Solve a problem where y is proportional to x^2

WORKED EXAMPLE

y is directly proportional to x. When x = 5, y = 30. Find y when x = 8.

1. Write the formula: $y = kx$.
2. Substitute the known values to find k: $30 = 5k$, so $k = 6$.
3. The formula is $y = 6x$.
4. Substitute $x = 8$: $y = 6 \times 8 = 48$.

Answer: y = 48

Questions

Show your working in the space under each question.

1. y is directly proportional to x. When x = 4, y = 20. Find y when x = 7.

2. y is directly proportional to x. When x = 6, y = 15. Write a formula for y in terms of x.

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3. y is directly proportional to x. When x = 8, y = 6. Find x when y = 15.

4. y is inversely proportional to x. When x = 3, y = 8. Find y when x = 6.

5. y is inversely proportional to x. When x = 5, y = 12. Write a formula for y in terms of x.

6. y is inversely proportional to x. When x = 4, y = 9. Find x when y = 12.

7. y is directly proportional to x^2. When x = 2, y = 12. Find y when x = 5.

8. The time taken to fill a pool is inversely proportional to the number of pumps used. 4 pumps take 6 hours. How long would 3 pumps take?

Answers: Direct and Inverse Proportion

Mark your own work, then go back to any question you got wrong before reading the tutor tip.

Q	QUESTION	ANSWER
1	y is directly proportional to x. When x = 4, y = 20. Find y when x = 7.	**y = 35**
2	y is directly proportional to x. When x = 6, y = 15. Write a formula for y in terms of x.	**y = 2.5x**
3	y is directly proportional to x. When x = 8, y = 6. Find x when y = 15.	**x = 20**
4	y is inversely proportional to x. When x = 3, y = 8. Find y when x = 6.	**y = 4**
5	y is inversely proportional to x. When x = 5, y = 12. Write a formula for y in terms of x.	**y = 60/x**
6	y is inversely proportional to x. When x = 4, y = 9. Find x when y = 12.	**x = 3**
7	y is directly proportional to x^2. When x = 2, y = 12. Find y when x = 5.	**y = 75**
8	The time taken to fill a pool is inversely proportional to the number of pumps used. 4 pumps take 6 hours. How long would 3 pumps take?	**8 hours**

TUTOR TIP

Always find k first. Write y = kx for direct proportion and y = k/x for inverse proportion, then substitute the pair of values you are given.

Stuck on a question? Work through it live with a tutor.

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