Direct and Inverse Proportion (Harder)

Grade 7 topic · Higher tier · Edexcel and AQA

How to use this pack
20 questions that get harder as you go. Questions 1–15 (65 marks) build up to the harder Grade 8–9 style questions at the end; aim to complete all 20. Show your working on the lines and write your final answer on the answer line, then mark yourself with the answers at the back. Diagrams are not drawn accurately. Total: 90 marks.

Warm-up

1 y is directly proportional to the square of x. When x = 3, y = 27. Find a formula for y in terms of x. **[4 marks]**

Answer _____

2 y is directly proportional to the cube of x. When x = 6, y = 432. Find a formula for y in terms of x. **[4 marks]**

Answer _____

3 y is directly proportional to the square root of x. When x = 9, y = 27. Find a formula for y in terms of x. **[4 marks]**

Answer _____

4 y is inversely proportional to x. When x = 1, y = 4. Find a formula for y in terms of x. **[4 marks]**

Answer _____

5 y is inversely proportional to the square of x. When x = 2, y = 7/4. Find a formula for y in terms of x. **[4 marks]**

Answer _____

Core

6 y is inversely proportional to the square root of x. When x = 9, y = 5/3. Find y when x = 25. **[4 marks]**

Answer _____

7 y is directly proportional to the square of x. When x = 3, y = 63. Find y when x = 5. **[4 marks]**

Answer _____

8 y is directly proportional to the cube of x. When x = 4, y = 320. Find y when x = 1. **[4 marks]**

Answer _____

9 y is directly proportional to the square root of x. When x = 1, y = 5. Find y when x = 16. **[4 marks]**

Answer _____

10 y is inversely proportional to x. When x = 5, y = 2/5. Find y when x = 6. **[4 marks]**

Answer _____

Stretch

11 y is inversely proportional to the square of x. When x = 2, y = 1/2. Find x when y = 1/8. **[5 marks]**

Answer _____

12 y is inversely proportional to the square root of x. When x = 9, y = 2/3. Find x when y = 2. **[5 marks]**

Answer _____

13 y is directly proportional to the square of x. When x = 2, y = 12. Find x when y = 75. **[5 marks]**

Answer _____

14 y is directly proportional to the cube of x. When x = 3, y = 243. Find x when y = 1944. **[5 marks]**

Answer _____

15 y is directly proportional to the square root of x. When x = 1, y = 2. Find x when y = 10. **[5 marks]**

Answer _____

Challenge

16 y is inversely proportional to x. x is increased by 50%. Work out the percentage change in y. Give your answer to 1 decimal place. **[5 marks]**

Answer _____

17 y is inversely proportional to the square of x. x is increased by 50%. Work out the percentage change in y. Give your answer to 1 decimal place. **[5 marks]**

Answer _____

18 y is inversely proportional to the square root of x. x is increased by 10%. Work out the percentage change in y. Give your answer to 1 decimal place. **[5 marks]**

Answer _____

19 y is directly proportional to the square of x. x is increased by 10%. Work out the percentage change in y. Give your answer to 1 decimal place. **[5 marks]**

Answer _____

20 y is directly proportional to the cube of x. x is increased by 50%. Work out the percentage change in y. Give your answer to 1 decimal place. **[5 marks]**

Answer _____