KS3 – Proportion

Section A – Direct Proportion

Q1 (3 marks)

Complete each statement.

a) If two quantities are in direct proportion, multiplying one quantity by 3 will _____ the other quantity by 3.

b) If y is directly proportional to x, the ratio y ÷ x stays _____.

c) Give one real-life example of quantities that can be directly proportional.

Q2 (4 marks)

Use direct proportion to find the missing values.

a) 3 notebooks cost £6. How much do 7 notebooks cost?

b) 5 kg of apples cost £12. How much do 8 kg cost?

c) A machine makes 24 parts in 3 minutes. How many parts does it make in 7 minutes?

d) 6 metres of fabric cost £27. How much do 10 metres cost?

Q3 (3 marks)

Find the value of one unit first, then solve.

a) 8 tickets cost £52. Find the cost of 13 tickets.

b) 12 identical bottles hold 9 litres altogether. How much do 20 bottles hold?

c) A car travels 168 miles using 6 gallons of fuel at a constant rate. How far would it travel using 9 gallons?

Q4 (3 marks)

y is directly proportional to x. Find the missing value.

a) y = 15 when x = 3. Find y when x = 8.

b) y = 28 when x = 7. Find y when x = 12.

c) y = 54 when x = 9. Find x when y = 78.

Q5 (3 marks)

For each pair of values, decide whether y is directly proportional to x. Give a reason.

a) x: 2, 4, 6 y: 5, 10, 15

b) x: 3, 6, 9 y: 8, 16, 25

c) x: 4, 8, 12 y: 7, 14, 21

Q6 (3 marks)

Write an equation connecting y and x.

a) y is directly proportional to x and y = 18 when x = 6.

b) y is directly proportional to x and y = 35 when x = 5.

c) y is directly proportional to x and y = 16 when x = 20.

Challenge

Q7 (4 marks)

y is directly proportional to x. When x = 12, y = 30.

Find x when y = 47.5.

Section B – Inverse Proportion

Q8 (3 marks)

Complete each statement.

a) If two quantities are inversely proportional, multiplying one quantity by 2 will _____ the other quantity.

b) If y is inversely proportional to x, the product x × y stays _____.

c) Give one real-life situation that can be modelled using inverse proportion.

Q9 (4 marks)

Use inverse proportion to find the missing values.

a) 4 workers take 12 hours to complete a job. How long would 6 workers take, assuming they work at the same rate?

b) 3 taps fill a tank in 20 minutes. How long would 5 identical taps take?

c) A journey takes 6 hours at 50 mph. How long would it take at 75 mph for the same distance?

d) 8 machines complete an order in 15 hours. How long would 12 identical machines take?

Q10 (3 marks)

x and y are inversely proportional. Find the missing value.

a) y = 12 when x = 5. Find y when x = 15.

b) y = 18 when x = 4. Find y when x = 9.

c) y = 7 when x = 12. Find x when y = 3.

Q11 (3 marks)

For each pair of values, decide whether y is inversely proportional to x. Give a reason.

a) x: 2, 4, 8 y: 24, 12, 6

b) x: 3, 6, 9 y: 18, 9, 5

c) x: 5, 10, 20 y: 16, 8, 4

Q12 (3 marks)

Write an equation connecting y and x.

a) y is inversely proportional to x and y = 10 when x = 6.

b) y is inversely proportional to x and y = 4 when x = 15.

c) y is inversely proportional to x and y = 25 when x = 8.

Q13 (3 marks)

Solve each inverse proportion problem.

a) 15 workers can complete a task in 8 days. How many days would 12 workers take?

b) 6 pumps empty a pool in 14 hours. How long would 4 identical pumps take?

c) A fixed journey takes 5 hours at an average speed of 72 km/h. What average speed is needed to complete it in 4 hours?

Challenge

Q14 (4 marks)

x and y are inversely proportional. When x = 7.5, y = 16.

Find x when y = 6.

Total: ____ / 46

Percentage: _____%