Direct and inverse proportion: 10 practice questions

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Name: _____ Date: _____

Attempt all questions and show your working. Suggested time: 15 to 20 minutes.

Section A: Consolidating (Questions 1-4)

Question 1

y is directly proportional to x, and y = 12 when x = 3.

(a) Find the constant of proportionality k in y = kx.

(b) Find y when x = 7.

Question 2

For each situation, state whether the relationship is direct proportion, inverse proportion or neither.

(a) The cost of petrol and the number of litres bought (at a fixed price per litre)

(b) The time taken for a 200 km trip and the average speed

(c) A person's age and their height

Question 3

A map has a scale of 1 : 50,000. Two towns are 4 cm apart on the map. How far apart are they in real life, in kilometres?

Question 4

Apples cost the same price per kilogram. 3 kg of apples cost $7.50. How much do 5 kg cost?

Section B: Standard (Questions 5-10)

Question 5

6 workers, all working at the same rate, take 10 days to build a fence. How long would 4 workers take to build the same fence at the same rate?

Question 6

Look at these two tables.

Table 1:

x	2	4	6	8	10
y	3	6	9	12	□

Table 2:

x	2	4	6	8	12
y	12	6	4	3	□

(a) Which table shows direct proportion and which shows inverse proportion? Explain how you can tell.

(b) Write a rule connecting y and x for each table.

(c) Fill in the missing value in each table.

Question 7

y is inversely proportional to x, and y = 8 when x = 5.

(a) Write a rule for y in terms of x.

(b) Find y when x = 4.

(c) Find x when y = 2.

Question 8

A drive takes 3 hours at an average speed of 80 km/h. How long would the same drive take at an average speed of 100 km/h?

Question 9

A model car is built to a scale of 1 : 20.

(a) The model is 22 cm long. How long is the real car, in metres?

(b) The painted area of the model is 150 cm^2. What is the painted area of the real car, in square metres?

Question 10

Two cylinders are similar. The smaller one is 6 cm tall and the larger one is 9 cm tall.

(a) Find the scale factor (larger to smaller) for lengths.

(b) Find the scale factor for surface areas.

(c) Find the scale factor for volumes.

(d) The smaller cylinder has a volume of 160 cm^3. Find the volume of the larger cylinder.

Direct and inverse proportion: answers

Question 1

Answer: (a) k = 4 (b) y = 28

Question 2

Answer: (a) Direct (b) Inverse (c) Neither

Question 3

Answer: 2 km (4 × 50,000 = 200,000 cm)

Question 4

Answer: $12.50 ($2.50 per kg)

Question 5

Answer: 15 days (6 × 10 = 60 worker-days)

Question 6

Answer: (a) Table 1 is direct (y/x = 1.5 every time); Table 2 is inverse (xy = 24 every time). (b) Table 1: y = 1.5x (accept y = 3/2x); Table 2: y = 24/x (c) Table 1: 15; Table 2: 2

Question 7

Answer: (a) y = 40/x (b) 10 (c) 20

Question 8

Answer: 2.4 hours (accept 2 hours 24 minutes) (distance 240 km)

Question 9

Answer: (a) 4.4 m (b) 6 m^2 ($150 \times 20^2 = 60{,}000$ cm^2)

Question 10

Answer: (a) 1.5 (b) 2.25 (c) 3.375 (d) 540 cm^3