

Class Test 4 25**Answer all questions. Show your working clearly.**

1. If b is directly proportional to a , and $b = 266$ when $a = 28$, find
 - (a) the value of a when $b = 596.6$, [2]
 - (b) the value of b when $a = 17$. [1]

2. y is directly proportional to x^2 and $y = 2.24$ when $x = 0.8$.
 - (a) Express y in terms of x . [1]
 - (b) Find y when $x = 4.5$. [1]
 - (c) Sketch the graph of y against x^2 . [1]

3. In a nursing home, the amount of food needed to feed the residents, q kg, is directly proportional to the square root of the number of residents in the home, p . 36 residents consume 1.6 kg more food than 16 residents.
 - (a) How much food would 121 residents need? [2]
 - (b) 12 kg of food is prepared. How many residents are in the home? [1]

4. The temperature at which a solution boils, $n^\circ\text{C}$, is inversely proportional to the square root of the height above sea level, h m, at which the solution is boiled. At 1225 m, the temperature at which the solution boils is 15°C lower than the boiling temperature at 784 m.
 - (a) When the solution is boiled at 576 m above sea level, what is the boiling temperature? [2]
 - (b) The solution boils at $46\frac{2}{3}^\circ\text{C}$. What height above sea level is the solution being boiled at? [1]

Chapter 1 • Direct and Inverse Proportions

5. Given that y is inversely proportional to x , and using the information found in the table below,

- find an equation connecting x and y ,
- copy and complete the table below.

x		2		5		12.5	14
y	17.5		2.5		0.7	0.56	

[3]

6. In a car workshop, 8 workers take 5 hours to service 25 cars.

- On a busy day, 42 cars need to be serviced. How long will these 8 workers take to service all 42 cars?
- There are 30 cars to be serviced. 3 workers are on leave. How long will the remaining workers take to service all 30 cars?

7. The volume of water in a tank, V cm^3 , is directly proportional to the square of the height of the water level, h cm. When the height is 38 cm, the volume of water is 25 992 cm^3 .

- Find the equation connecting h and V .
- When the height of the water level is 17.2 cm, find the volume of water in the tank.
- When the volume of water in the tank is 43 218 cm^3 , find the height of the water level.

8. If n is inversely proportional to \sqrt{m} , and $n = 3$ when $m = 16$, find

- an equation connecting m and n ,
- the value of n when $m = 256$,
- the value of m when $n = 0.4$.