Class Test 3 》

25

Answer all questions. Show your working clearly.

1. The height, h metres, that a balloon rises to is inversely proportional to the square of the mass of the balloon, x grams. A balloon with the mass of 15 g rises $8\frac{1}{3}$ m higher than one with the mass of 30 g.
   (a) Find the height a balloon rises to when its mass is 12.5 g. [2]
   (b) A balloon rises to 0.16 m. What is its mass? [1]

2. y is directly proportional to $\sqrt{x}$ and $y = 36$ when $x = 9$.
   (a) Express y in terms of x. [1]
   (b) Find y when $x = 11.56$. [1]
   (c) Sketch the graph of y against $\sqrt{x}$. [1]

3. The volume of water in a container, b cm^3, is directly proportional to the square of its height, a cm. Copy and complete the following table.

a	0.5			5		8	9.2
b		3	6.75		28.83	48	

[4]

4. If q is inversely proportional to p, and $q = 0.4$ when $p = 7.5$, find
   (a) the value of p when $q = 0.1875$, [2]
   (b) the value of q when $p = 48$. [1]

Chapter 1 • Direct and Inverse Proportions

5. 12 volunteers take 375 minutes to pack 1500 goodie bags.
    (a)   What is the minimum number of volunteers needed to pack 10 000 goodie bags within 10 hours?   [1]
    (b)   48 volunteers start packing goodie bags. 3 h 20 min later, 12 more volunteers join in. What is the total time taken to pack 10 000 goodie bags?   [2]

6. On a prepaid mobile phone line, calls are charged per minute. The original prepaid value is $13.20. After 148 minutes of phone calls are made, the remaining value is $4.32.
    (a)   Find an equation connecting the length of a phone call and the cost of that call.   [1]
    (b)   The prepaid value is currently $27.48. What is the maximum number of minutes of phone calls that can be made?   [1]
    (c)   A total of 172 minutes of phone calls is used. What is the total cost?   [1]

7. The time taken for a certain number of cakes to be baked, t hours, is inversely proportional to the number of bakers, s. 5 bakers take 8 h 24 min to finish baking.
    (a)   Find an equation connecting s and t.   [1]
    (b)   How long would it take 12 bakers to finish baking? Express your answer in h and min.   [1]
    (c)   A team of bakers take 5 h 15 min to finish baking. How many bakers are in the team?   [1]

8. If y is directly proportional to x^2, and $y = 100.8$ when $x = 6$, find
    (a)   an equation connecting x and y,   [1]
    (b)   the value of y when $x = 8$,   [1]
    (c)   the values of x when $y = 403.2$.   [1]