3.8 Inverse Proportion: 30-minute Pack

Calculators not allowed · about 30 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A pump fills a tank at a rate that is inversely proportional to the time taken. If the pump fills the tank in 2 hours at 90 litres per hour, what rate (in litres per hour) will fill the same tank in 6 hours?

(2)

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2 A simple inverse proportion problem: The time t (in minutes) to boil water varies inversely with the power p (in units) of the kettle. When p = 4, t = 9. Calculate t when p = 6.

(3)

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3 Two quantities x and y are inversely proportional. When x = 5, y = 12. Find y when x = 15.

(2)

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4 A group of 8 people can paint a fence in 15 hours. Each person paints at the same rate. How many people are needed to paint it in 30 hours?

(3)

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5 y is inversely proportional to x. When x = 5, y = 4. Work out the value of y when x = 2.

(2)

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6 9 workers take 10 days to build a wall. All workers work at the same rate. How long would 15 workers take?

(3)

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7 y is directly proportional to x. When x = 5, y = 25. Work out the value of y when x = 18.

(2)

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8 6 workers take 20 days to build a wall. All workers work at the same rate. How long would 24 workers take?

(3)

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9 If y is inversely proportional to x and y = 8 when x = 1.5, find x when y = 12.

(2)

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10 State whether the number of days needed to build a wall and the number of identical builders (working at the same steady rate) are directly proportional or inversely proportional.

(1)

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Mark scheme · 3.8 Inverse Proportion: 30-minute Pack

Question 1

use rate * time = constant volume: volume = 90*2 = 180 litres	M1
30 litres per hour cao	A1

Answer: **30 litres per hour**

Question 2

find k = p*t = 4*9 = 36	M1
substitute p=6: t = 36/6	M1
6 minutes cao	A1

Answer: **6 minutes**

Question 3

use k = x*y = 5*12 = 60 or state y = k/x	M1
4 cao	A1

Answer: **4**

Question 4

8 x 15 = 120	M1
120 ÷ 30	M1
4 cao	A1

Answer: **4 people**

Question 5

y = k/x with k = 5 x 4 = 20	M1
10 cao	A1

Answer: **10**

Question 6

9 x 10 = 90 worker-days	M1
90 ÷ 15	M1
6 days cao	A1

Answer: **6 days**

Question 7

y = kx with k = 25 ÷ 5	M1
90 cao	A1

Answer: **90**

Question 8

6 x 20 = 120 worker-days	M1
120 ÷ 24	M1
5 days cao	A1

Answer: **5 days**

Question 9

find k = x*y = 1.5*8 = 12 or state y = k/x	M1
x = 1 cao	A1

Answer: **1**

Question 10

Inversely proportional (oe)	B1

Answer: **Inversely proportional**

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