FOUNDATION & HIGHER

SAME AT BOTH TIERS

Name ..... Class .....

R10: Direct and inverse proportion

Solve problems involving direct and inverse proportion

20 marks · 25 minutes · Non-calculator

1) 12 workers can do a job in 15 days. The job must be finished in 10 days. How many extra workers are needed?

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[Question 1: 3 marks]

2) The cost of carpet is proportional to its area. $12\,m^2$ costs £180. Find the cost for a room 4.5 m by 3.2 m.

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[Question 2: 3 marks]

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3) A journey takes 2 hours at 60 km/h. How long does it take at 75 km/h? Give your answer in hours and minutes.

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[Question 3: 3 marks]

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4) y is directly proportional to x^2, and $y = 12$ when $x = 2$. Find the positive value of x when $y = 75$

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[Question 4: 3 marks]

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5) The pressure of a gas is inversely proportional to its volume. $P = 200$ when $V = 3$. Find V when $P = 150$

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[Question 5: 2 marks]

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6) Food for 20 animals lasts 30 days. After 6 days, 5 more animals arrive. How many days does the food last altogether?

..... days

[Question 6: 4 marks]

7) Light intensity is inversely proportional to the square of the distance. It is 80 units at 2 m. Find the intensity at 4 m.

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[Question 7: 2 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	6	180 worker-days (P1); 18 workers (P1); 6 extra (A1).
2	£216	£15 per m^2 (P1); 14.4 m^2 (P1); A1.
3	1 h 36 min	120 km (P1); 1.6 hours (P1); A1.
4	5	$y = 3x^2$ (P1); $x^2 = 25$ (P1); A1.
5	4	$PV = 600$ (P1); A1.
6	25.2	Food left for 24 days for 20 animals (P1); 480 animal-days (P1); 480 ÷ 25 = 19.2 (P1); 25.2 (A1).
7	20	Distance doubled so intensity ÷4 (P1); A1.