

MULTIPLICATIVE REASONING

Answer all of these questions. Remember to show your working out in all questions.

MAIN QUESTIONS

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| 1. If y is directly proportional to x and $y = 15$ when $x = 3$, find y when $x = 7$ | 2. Convert £45 to euros at an exchange rate of £1 = €1.17 |
| 3. Convert 5km to miles using 8km = 5 miles | 4. If 4 pencils cost £1.20, find the cost of 7 pencils |
| 5. A recipe uses 300g flour for 12 cakes. How much flour for 20 cakes? | 6. If 5 workers complete a job in 8 days, how long for 8 workers? |
| 7. Convert 25cm to inches using 2.5cm = 1 inch | 8. If $y \propto x$ and $y = 24$ when $x = 6$, find x when $y = 36$ |
| 9. Convert 3.5kg to pounds using 1kg = 2.2lb | 10. A map scale is 1:25000. What is 8cm on the map in real life? |
| 11. If 8 litres of paint covers 40m^2 , how much for 65m^2 ? | 12. Convert 55mph to km/h using 5 miles = 8km |
| 13. Two similar triangles have scale factor 3:5. If the smaller area is 27cm^2 , find the larger area | 14. If $P \propto Q^2$ and $P = 48$ when $Q = 4$, find P when $Q = 6$ |
| 15. Convert 15 gallons to litres using 1 gallon = 4.5 litres | 16. A car uses 6 litres for 90km. How much for 150km? |

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| <p>17. Two similar shapes have lengths in ratio 2:7. Find the ratio of their volumes</p> <p>19. Convert 40°C to Fahrenheit using $F = 1.8C + 32$</p> <p>21. Two similar cylinders have heights 5cm and 8cm. Find the ratio of their surface areas</p> <p>23. Convert 12 stone to kg using 1 stone = 6.35kg</p> <p>25. Two similar pyramids have volumes 64cm^3 and 216cm^3. Find the ratio of their heights</p> <p>27. Convert 30m/s to km/h</p> <p>29. Two similar cones have surface areas $36\pi\text{ cm}^2$ and $64\pi\text{ cm}^2$. Find the ratio of their volumes</p> | <p>18. If $y \propto \sqrt{x}$ and $y = 8$ when $x = 16$, find y when $x = 64$</p> <p>20. A recipe for 6 requires 450g meat. How much for 10 people?</p> <p>22. If $A \propto B^3$ and $A = 54$ when $B = 3$, find A when $B = 5$</p> <p>24. A machine makes 240 items in 3 hours. How many in 7 hours?</p> <p>26. If $y \propto 1/x$ and $y = 12$ when $x = 2$, find y when $x = 6$</p> <p>28. A tap fills a tank in 15 minutes. How long for 3 taps?</p> <p>30. If $P \propto Q$ and $P = 28$ when $Q = 7$, and $R \propto Q^2$ and $R = 63$ when $Q = 3$, find P when $R = 112$</p> |
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MASTER QUESTIONS



- M1. A recipe for chocolate mousse requires 200g chocolate for 4 servings. If I want to make 10 servings and chocolate costs £3.50 per 100g, how much will the chocolate cost?
- M2. Two similar statues have heights of 1.2m and 2.4m. The smaller statue weighs 15kg. Calculate the weight of the larger statue, assuming they are made of the same material.

- M3.** A car's fuel consumption is 12km per litre when driving in the city and 16km per litre on the motorway. If the car travels 60km in the city and 120km on the motorway, and fuel costs £1.45 per litre, calculate the total fuel cost.
- M4.** A map has a scale of 1:50000. Two towns are 8.5cm apart on the map. Calculate the actual distance between them in kilometres.
- M5.** A company's profit is directly proportional to the square of its advertising budget. When they spend £2000 on advertising, their profit is £8000. What profit would they make if they spent £3500 on advertising?
- M6.** A swimming pool is filled by two pipes. Pipe A alone fills it in 6 hours, pipe B alone fills it in 4 hours. How long will it take to fill the pool if both pipes are used together?
- M7.** The intensity of light from a bulb is inversely proportional to the square of the distance from the bulb. At 2m from the bulb, the intensity is 80 lux. What is the intensity at 5m from the bulb?
- M8.** A rectangular photograph measuring 15cm by 10cm is enlarged so that the longer side becomes 27cm. What is the area of the enlarged photograph?
- M9.** A car hire company charges £45 per day plus 15p per mile. Mr Jones hires a car for 3 days and drives 280 miles. Calculate the total cost.
- M10.** The time taken to complete a journey is inversely proportional to the average speed. A journey takes 4 hours at an average speed of 60km/h. How long would the same journey take at an average speed of 75km/h?