

Rates and Compound Measures

Use the formula triangle and unit rates to calculate and compare speed, density, and best buys.



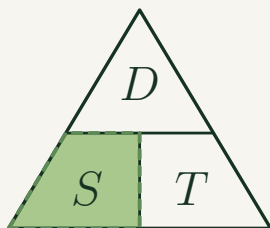
Name _____

Date _____

Show your method

Use the formula triangle: cover the quantity you want, then multiply (top = left $\times$ right) or divide (a bottom cell = top $\div$ the other bottom cell). Show your substitution and answer, with units.

Worked example Find the speed. $D = 140$ km, $T = 2$ h.



Covering S : $S = D \div T$

$$S = 140 \div 2$$

$$S = 70 \text{ km/h}$$

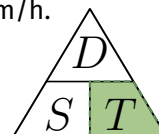
1. Find the speed. $D = 120$ km, $T = 3$ h.



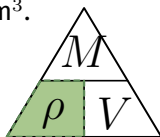
2. Find the distance. $S = 55$ km/h, $T = 4$ h.



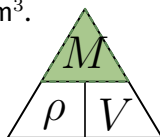
3. Find the time. $D = 175$ km, $S = 25$ km/h.



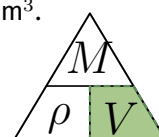
4. Find the density. $M = 84$ g, $V = 12$ cm³.



5. Find the mass. $\rho = 6$ g/cm³, $V = 18$ cm³.



6. Find the volume. $M = 270$ g, $\rho = 9$ g/cm³.



7. A 3 kg bag of flour costs \$5.40 and a 5 kg bag costs \$8.50. Find the cost per kg of each and state the better buy.

8. A car travels 245 km in 3.5 hours. Calculate its average speed.

9. A runner covers 300 m in 40 seconds. Find their speed in m/s.

Rates and Compound Measures (continued)



Mixed rate problems and reading a distance-time graph.

Name _____

Date _____

10. A block has a mass of 245 g and a volume of 35 cm^3 . Find its density.

11. A 6-pack of yoghurt costs \$4.80 and an 8-pack costs \$6.00. Find the cost per yoghurt for each pack and state the better buy.

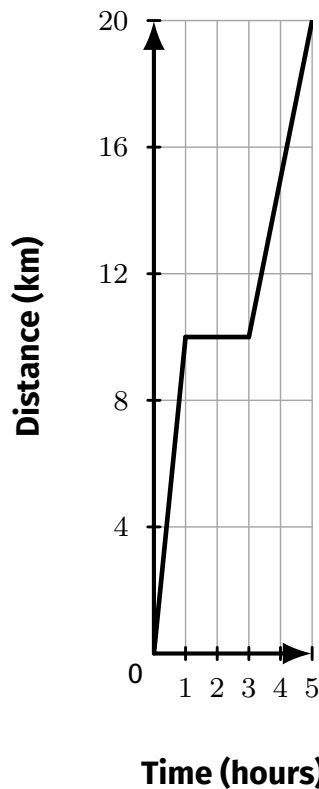
12. A cyclist travels at 18 km/h for 2.5 hours. Find the distance travelled.

13. A hiker walks 12 km at 4 km/h, then a further 9 km at 3 km/h. Find the total time taken and the average speed for the whole journey.

14. A train travels for 1.5 hours at 90 km/h, then for 2 hours at 75 km/h. Find the total distance and the average speed, to 2 decimal places.

15. Two containers hold the same volume of liquid, 500 cm^3 . Container A's liquid has a mass of 450 g and Container B's has a mass of 600 g. Which liquid is denser, and by how much?

16. The graph shows a delivery van's journey. Find its speed for the first hour, state what the flat section between 1 and 3 hours represents, then find its speed for the final part of the journey (3 to 5 hours).



Working
