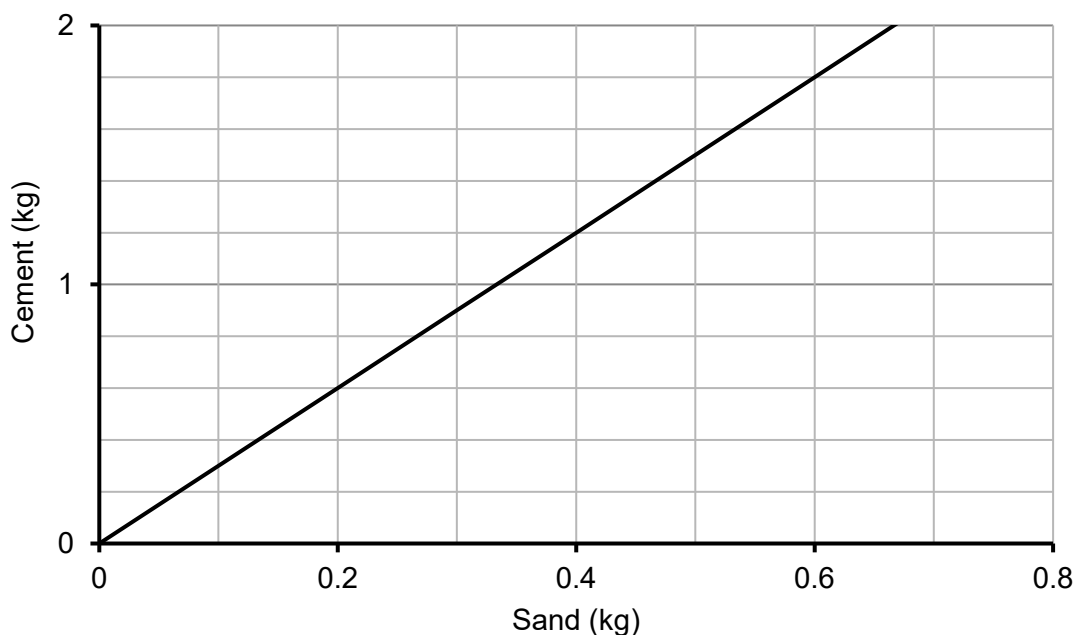


Higher Check In - 5.01 Calculations with ratio

1. Write $\frac{4}{5} : 3 : 0.1$ in the ratio $1 : m : n$.
2. Divide 600 miles in the ratio $3 : 5 : 2$. Using the approximation, 5 miles \approx 8 kilometres, give your answer in kilometres.
3. Write the ratio of the exterior angle of a regular pentagon to its interior angle. Give your answer in its simplest form.
4. An amount is split in the ratio $7 : 3 : 5$. A quarter is taken of the smallest share. What fraction of the total amount is this?
5. A fish pie recipe requires 300 grams of fish for 4 people. How many kilograms of fish would be needed for 30 people?
6. A 5 m length of wire is cut into three sections, A, B and C. A is half the length of B and B is half the length of C. Show that each individual length is greater than 70 cm.
7. The graph shows the amount of sand that must be added to cement to make building mortar.



Show that 32.8 kg of building mortar containing 24.4 kg of cement would not contain the correct ratio of sand and cement.

8. A bag contains only yellow, red and pink sweets. The ratio of yellow sweets to red sweets is $1 : 9$. The ratio of red sweets to pink sweets is $3 : 5$. Show that 36% of the sweets are red.

9. Jana, Gray and Bilal share some money in the ratio 2 : 3 : 7. Gray receives £130 less than Bilal. Calculate the total amount of money they shared.
10. Blue paint and red paint are mixed in the ratio 3 : 5 to make 32 litres of paint. How much more red paint needs to be added to the mixture so that the ratio of blue paint to red paint becomes 2 : 7?

Extension

Draw a large triangle ABC.

Bisect side AB and label the midpoint M.

Bisect side BC and label the midpoint N.

Connect sides MN.

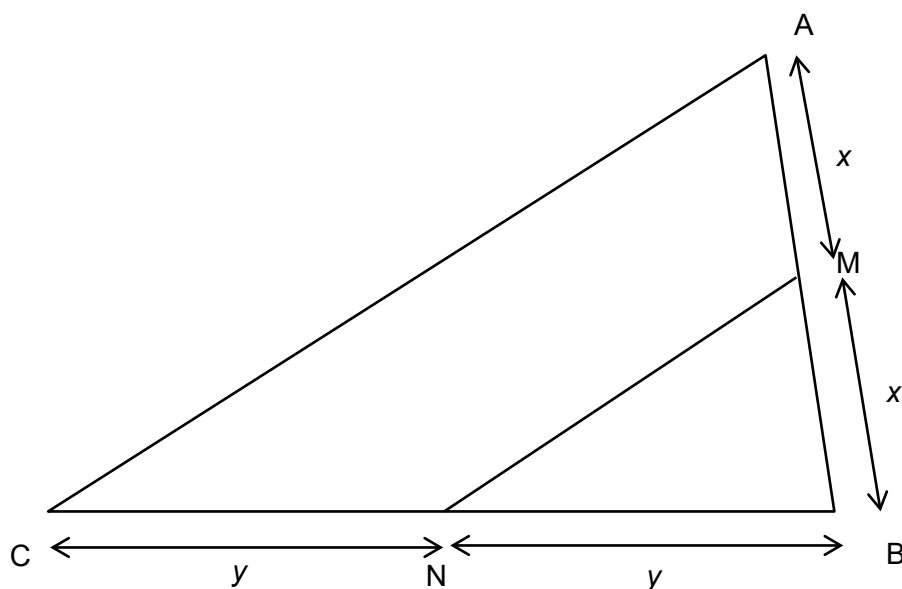
Using ratios, explain why the area of ABC is four times the area of MBN.

GCSE (9–1) MATHEMATICS

Answers

1. $1 : 3.75 : 0.125$ or $1 : 3\frac{3}{4} : \frac{1}{8}$
2. 288 km, 480 km, 192 km
3. $72 : 108$ simplified to $2 : 3$
4. $\frac{1}{20}$
5. 2.25 kg
6. Ratio A : B : C is $1 : 2 : 4$ or $\frac{5}{7} : \frac{10}{7} : \frac{20}{7}$, so smallest length is 71.4 cm
7. Ratio from the graph is $1 : 3$. $32.8 \div 4 \times 3 = 24.6$ kg
8. $1 : 9 : 15$ so $9 \div 25 \times 100 = 36\%$
9. £390
10. 22 litres

Extension



$AB = 2MB$
 $CB = 2NB$
Angle B common
Therefore similar triangles

Scale factor of lengths $1 : 2$
Scale factor of areas $1^2 : 2^2 = 1 : 4$

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Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Find the ratio of quantities in the form $1 : m : n$			
AO1	2	Split a quantity into three or more parts given the ratio			
AO1	3	Find the ratio of quantities in the form $a : b$ and simplify			
AO1	4	Interpret a ratio as a fraction of a whole			
AO1	5	Solve simple proportion problem			
AO2	6	Interpret a ratio as a fraction of a whole			
AO2	7	Understand the relationship between ratio and linear functions			
AO2	8	Solve a problem involving more than one ratio			
AO3	9	Solve a problem involving division of a quantity into parts			
AO3	10	Solve a problem involving ratio and proportion			

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