

Week 12

This week in a nutshell:

This week puts to use many of the skills from the previous five weeks. Although much of this work can be answered independently of the previous questions, linking back to the topics covered will be useful.

Question 1: Compound measures

Question 2: Applied percentages

Question 3: Using formulae

Question 4: Best buys

Question 5: Compound shapes

Many of the questions can be answered using different methods including algebraic methods, diagrams or written calculations. If students have attempted different methods, a useful exercise is to look at the efficiencies of the methods used.

This week's ideas for class discussion include:

Question 1: **Compound measures**

- Why do you think speed, density, pressure, etc are known as “compound measures”?

Question 2: **Applied percentages**

- When dealing with percentages in real life, how might the accuracy of rounding affect the presentation of the answer?

Question 3: **Using formulae**

- Which famous formulae do you know? What are they used for?

Question 4: **Best buys**

- Even if an option is cheaper per unit, does that make it a “best buy” for everyone?

Question 5: **Compound shapes**

- We solve compound shape problems by breaking them down into simpler shapes. Where else in maths do we split a problem into simpler chunks to deal with it more easily?

Week 12: Day 1

- 1) A car travels 125 km in 5 hours. What is the average speed of the journey?

- 2) A t-shirt originally costs £16. It has 10% off in a sale. How much does the t-shirt cost now?

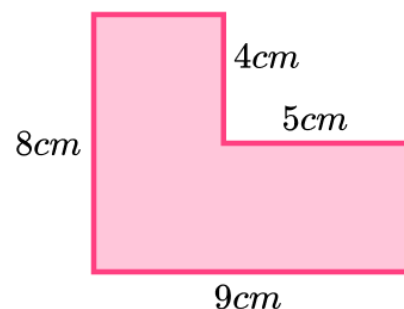
- 3) Given $P = \frac{F}{A}$, work out F when $P = 15$ and $A = 8$.

- 4) 2 litres of juice costs £1.84.
5 litres of juice costs £4.55.

Which size of juice is best value?



- 5) Calculate the perimeter of this shape.



Week 12: Day 1 Answers

- 1) A car travels 125 km in 5 hours. What is the average speed of the journey?

25 km/h

- 2) A t-shirt originally costs £16. It has 10% off in a sale. How much does the t-shirt cost now?

£14.40

- 3) Given $P = \frac{F}{A}$, work out F when $P = 15$ and $A = 8$.

$F = 120$

- 4) 2 litres of juice costs £1.84.

92 p/l

5 litres of juice costs £4.55.

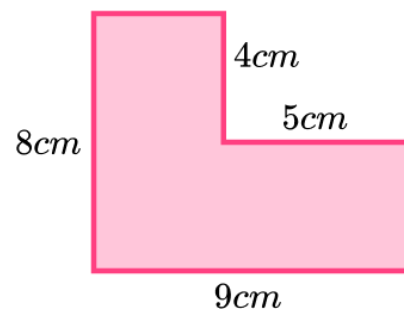
91 p/l

Which size of juice is best value? 5L



- 5) Calculate the perimeter of this shape.

34cm



Week 12: Day 2

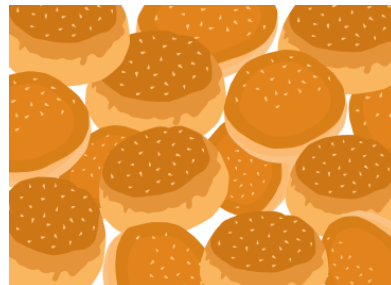
- 1) A sack of stones has a mass of 180 kg. The volume of the stones is 0.25 m^3 . What is the density of the stones in kg/m^3 ?

- 2) A laptop is in a sale and has 20% off. If the sale price is £400, what was the original price?

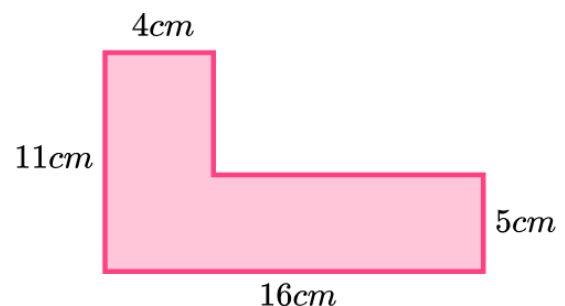
- 3) Force = mass x acceleration

What is the acceleration of a 2 kg mass moving subject to a force of 12N ?

- 4) A bakery sells 8 bread rolls for £3.20. The same bakery sells 12 bread rolls for £4.68. Is it better value to buy 8 or 12 bread rolls?



- 5) Calculate the area of this shape.



Week 12: Day 2 Answers

- 1) A sack of stones has a mass of 180 kg. The volume of the stones is 0.25 m^3 . What is the density of the stones in kg/m^3 ?

720 kg/m^3

- 2) A laptop is in a sale and has 20% off. If the sale price is £400, what was the original price?

£500

- 3) Force = mass x acceleration

What is the acceleration of a 2 kg mass moving subject to a force of 12N ?

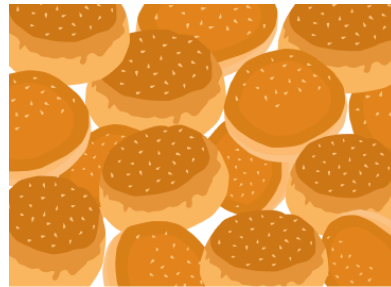
6 m/s^2

- 4) A bakery sells 8 bread rolls for £3.20. The same bakery sells 12 bread rolls for £4.68. Is it better value to buy 8 or 12 bread rolls?

8 rolls - 40p per roll

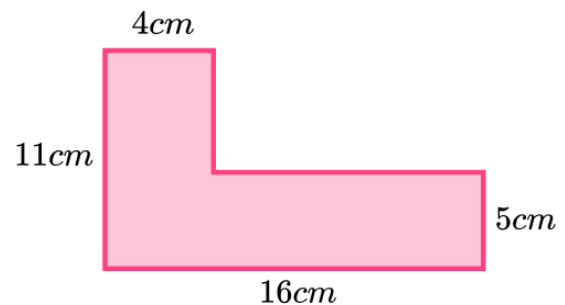
12 rolls - 39p per roll

Better to buy 12.



- 5) Calculate the area of this shape.

104cm^2



Week 12: Day 3

- 1) A cyclist has an average speed of 14 km/h. How far do they cycle in 3.5 hours?

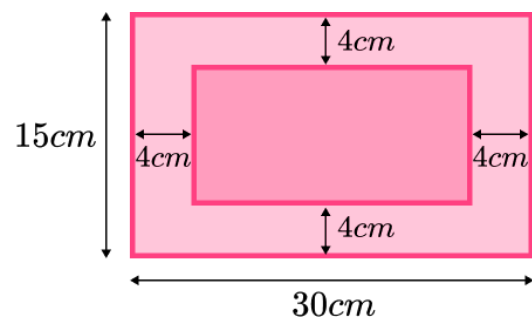
- 2) The height of a tree has increased by 15%. The tree was 2.5m tall. How tall is the tree now?

- 3) If $v = 14$, $a = 3$ and $t = 4$, use this formula to calculate u : $v = u + at$

- 4) K-Star fuel costs £29.75 for 25 litres.
FS75 fuel costs £36 for 30 litres.

Which fuel is better value?

- 5) Determine the area of the light pink section around the middle rectangle.



Week 12: Day 3 Answers

- 1) A cyclist has an average speed of 14 km/h. How far do they cycle in 3.5 hours?

49 km

- 2) The height of a tree has increased by 15%. The tree was 2.5m tall. How tall is the tree now?

2.875 m

- 3) If $v = 14$, $a = 3$ and $t = 4$, use this formula to calculate u : $v = u + at$

$u = 2$

- 4) K-Star fuel costs £29.75 for 25 litres.
FS75 fuel costs £36 for 30 litres.

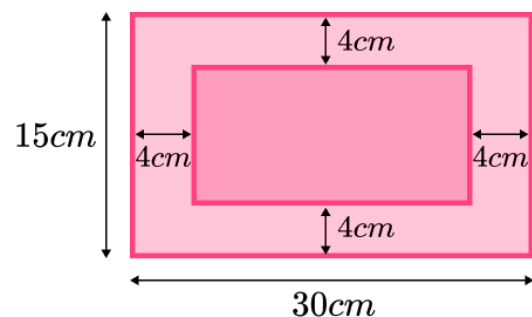
K-Star - 119p per litre
FS75 - 120p per litre

Which fuel is better value?

K-Star is better value.

- 5) Determine the area of the light pink section around the middle rectangle.

296cm²



Week 12: Day 4

- 1) Harry gets paid £9.25 per hour. How much does he earn if he works 8 hours?

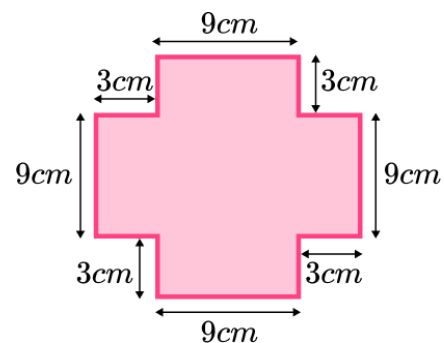
- 2) A village population has increased by 7% over 10 years. The current population is 2,889. What was the population 10 years ago?

- 3) Calculate the kinetic energy of a particle with mass (m) of 3kg and velocity (v) of 4m/s, using the formula $KE = \frac{1}{2}mv^2$

- 4) Coffee sachets are sold in different quantities. Which offer is best value?



- 5) What is the area of this shape?



Week 12: Day 4 Answers

- 1) Harry gets paid £9.25 per hour. How much does he earn if he works 8 hours?

£74

- 2) A village population has increased by 7% over 10 years. The current population is 2,889. What was the population 10 years ago?

2700

- 3) Calculate the kinetic energy of a particle with mass (m) of 3kg and velocity (v) of 4m/s, using the formula $KE = \frac{1}{2}mv^2$

24J

- 4) Coffee sachets are sold in different quantities. Which offer is best value?

The box with 40 sachets offers the best value.

24p per sachet 22p per sachet

15 sachets

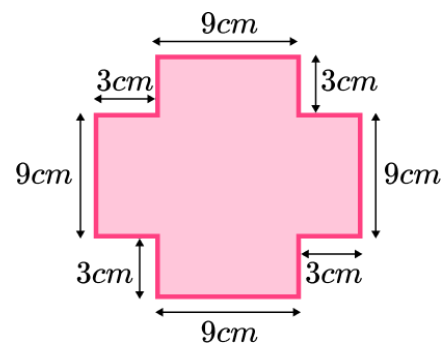
£ 3.60

40 sachets

£ 8.80

- 5) What is the area of this shape?

189cm²



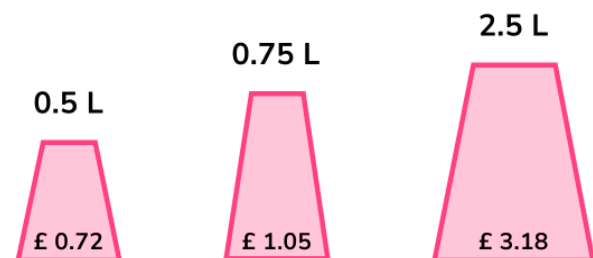
Week 12: Day 5

- 1) A plumber charges £78.75 for replacing a sink. The work took 2.5 hours to complete. What was the plumber's hourly rate?

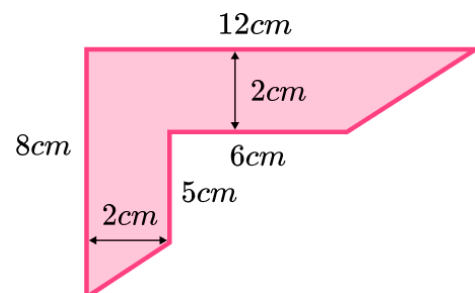
- 2) The price of a TV is reduced by 10% but it does not sell. The price is reduced by a further 10%. The TV was £800 at first. What is the cost now?

- 3) Convert 25°C to Fahrenheit (F), using the formula $F = (C \times \frac{9}{5}) + 32$

- 4) Which size bottle of cola is best value?



- 5) What is the area of this shape?



Week 12: Day 5 Answers

- 1) A plumber charges £78.75 for replacing a sink. The work took 2.5 hours to complete. What was the plumber's hourly rate?

£31.50

- 2) The price of a TV is reduced by 10% but it does not sell. The price is reduced by a further 10%. The TV was £800 at first. What is the cost now?

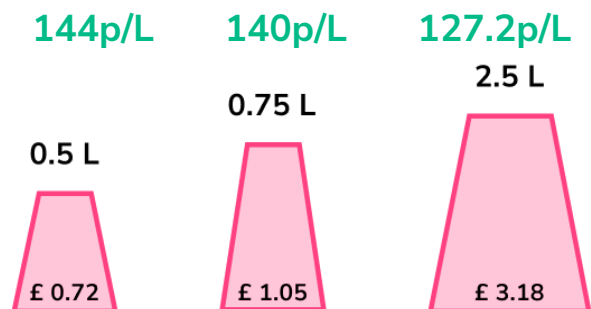
£648

- 3) Convert 25°C to Fahrenheit (F), using the formula $F = (C \times \frac{9}{5}) + 32$

77°F

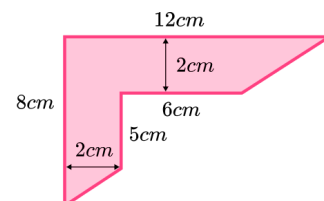
- 4) Which size bottle of cola is best value?

The 2.5L bottle offers the best value.



- 5) What is the area of this shape?

31cm^2



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