

## Week 11

### This week in a nutshell:

Some of the topics here are prone to common misconceptions, so taking time to eliminate these early on will be of huge benefit.

**Question 1:** Adding and subtracting fractions

**Question 2:** Reverse percentages

**Question 3:** Rearranging formulae

**Question 4:** Interior/exterior angles

**Question 5:** Volume

Simple sketches for angles questions could be encouraged this week. Once again, this week sees students manipulate expressions and equations. It is worth reminding students about how to find lowest common denominators. Also stress the justification of inverse operations and how to note this alongside calculations.

### This week's ideas for class discussion include:

**Question 1: Adding and subtracting fractions**

- How do you find a lowest common denominator (LCD)?
- Do we have to use the LCD or will any common denominator work?

**Question 2: Reverse percentages**

- Why might it be important to be able to “reverse” a mathematical procedure carried out by someone else?

**Question 3: Rearranging formulae**

- Give me some examples from other subjects where this will be useful.

**Question 4: Interior/exterior angles**

- Which angle facts lead to the rules we used for interior/exterior angles?
- Can you think how exterior angles predict tiling and tessellation options?

**Question 5: Volume**

- What is different when calculating the volume of an object with curved faces?

## Week 11: Day 1

1) Calculate:

a)  $\frac{1}{2} + \frac{1}{2}$

b)  $\frac{1}{5} + \frac{3}{5}$

2) What was the original amount if...

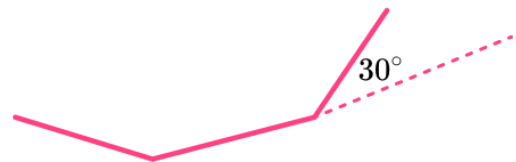
a) 50% is 27?

b) 10% is 14?

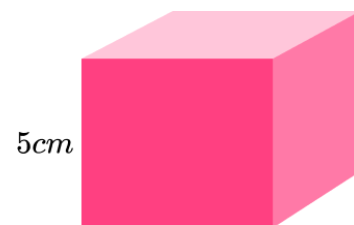
3) Make  $a$  the subject.

$$F = ma$$

4) Below is part of a regular polygon. Given the exterior angle is  $30^\circ$ , how many sides does this polygon have?



5) What is the volume of this cube?



## Week 11: Day 1 Answers

1) Calculate:

a)  $\frac{1}{2} + \frac{1}{2} = 1$

b)  $\frac{1}{5} + \frac{3}{5} = \frac{4}{5}$

2) What was the original amount if...

a) 50% is 27?  
**54**

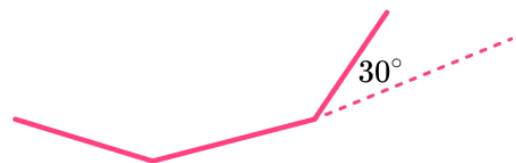
b) 10% is 14?  
**140**

3) Make  $a$  the subject.

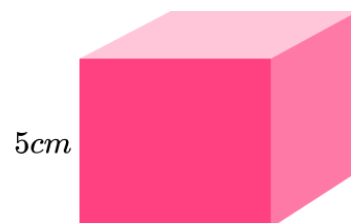
$$F = ma$$

$$a = \frac{F}{m}$$

4) Below is part of a regular polygon. Given the exterior angle is  $30^\circ$ , how many sides does this polygon have?  
**12**



5) What is the volume of this cube?  
 **$125\text{cm}^3$**



## Week 11: Day 2

1) Calculate:

a)  $\frac{6}{7} - \frac{3}{7}$

b)  $\frac{1}{2} + \frac{3}{4}$

2) What was the original amount if...

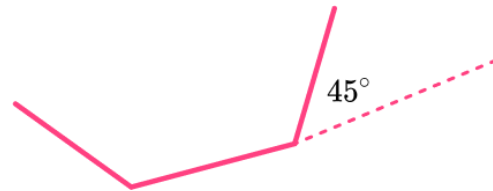
a) 25% is 16?

b) 75% is 36?

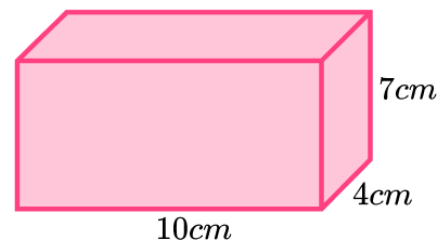
3) Make  $V$  the subject.

$$F - E + V = 2$$

4) Below is part of a regular polygon. Given the exterior angle is  $45^\circ$ , how many sides does this polygon have?



5) What is the volume of this cuboid?



## Week 11: Day 2 Answers

1) Calculate:

a)  $\frac{6}{7} - \frac{3}{7} = \frac{3}{7}$

b)  $\frac{1}{2} + \frac{3}{4} = \frac{5}{4}$

2) What was the original amount if...

a) 25% is 16?  
**64**

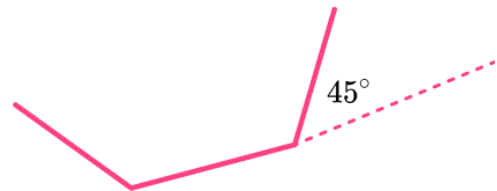
b) 75% is 36?  
**48**

3) Make  $V$  the subject.

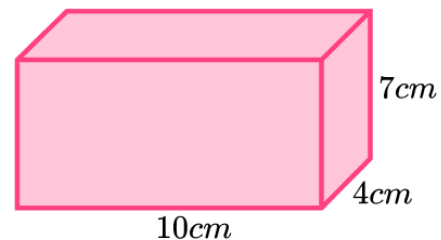
$$F - E + V = 2$$

$$V = 2 + E - F$$

4) Below is part of a regular polygon. Given the exterior angle is  $45^\circ$ , how many sides does this polygon have?  
**8**



5) What is the volume of this cuboid?  
 **$280\text{cm}^3$**



## Week 11: Day 3

1) Calculate:

a)  $\frac{1}{3} + \frac{1}{4}$

b)  $\frac{3}{8} - \frac{1}{4}$

2) What was the original amount if...

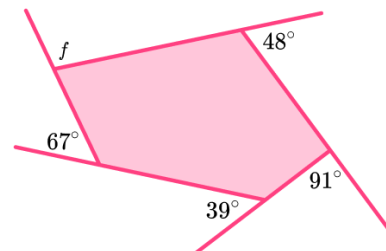
a) 5% is 7?

b) 20% is 19?

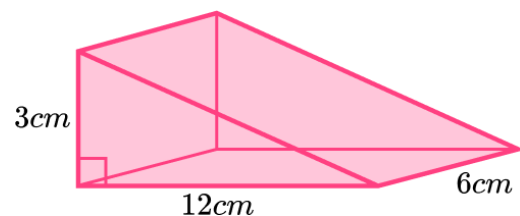
3) Make  $b$  the subject.

$$s = \frac{a + b + c}{2}$$

4) Work out the size of angle  $f$ .



5) Work out the volume of this triangular prism.



## Week 11: Day 3 Answers

1) Calculate:

a)  $\frac{1}{3} + \frac{1}{4} = \frac{7}{12}$

b)  $\frac{3}{8} - \frac{1}{4} = \frac{1}{8}$

2) What was the original amount if...

a) 5% is 7?  
**140**

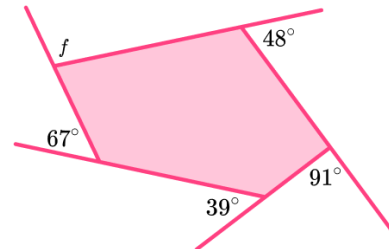
b) 20% is 19?  
**95**

3) Make  $b$  the subject.

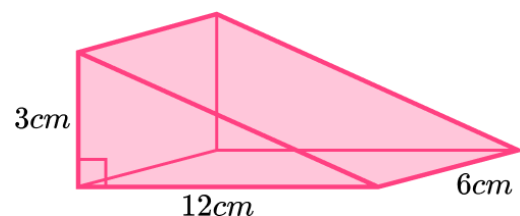
$$s = \frac{a + b + c}{2}$$

$$b = 2s - a - c$$

4) Work out the size of angle  $f$ .  
**115°**



5) Work out the volume of this triangular prism.  
**108cm<sup>3</sup>**



## Week 11: Day 4

1) Calculate:

a)  $1\frac{1}{2} + \frac{3}{5}$

b)  $2\frac{7}{10} - \frac{17}{20}$

2) What was the original amount if...

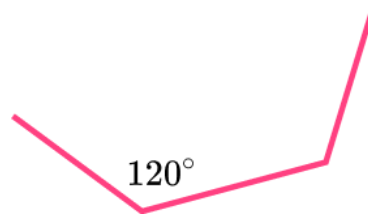
a) 150% is 96?

b) 250% is 80?

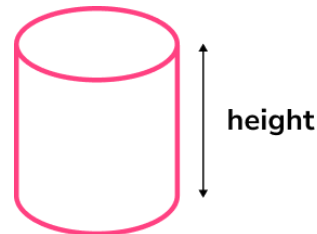
3) Make  $t$  the subject.

$$s = u + at$$

4) The interior angle of a regular polygon is  $120^\circ$ . How many sides does this polygon have?



5) The area of the circular cross section for this cylinder is  $31.4 \text{ cm}^2$ . The volume of the cylinder is  $157 \text{ cm}^3$ . What is the height of the cylinder?





## Week 11: Day 4 Answers

1) Calculate:

a)  $1\frac{1}{2} + \frac{3}{5} = \frac{21}{10}$

b)  $2\frac{7}{10} - \frac{17}{20} = \frac{37}{20}$

2) What was the original amount if...

a) 150% is 96?  
**64**

b) 250% is 80?  
**32**

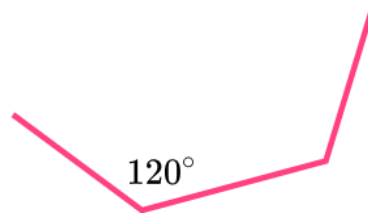
3) Make  $t$  the subject.

$$s = u + at$$

$$t = \frac{s - u}{a}$$

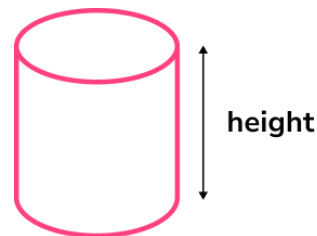
4) The interior angle of a regular polygon is  $120^\circ$ . How many sides does this polygon have?

**6**



5) The area of the circular cross section for this cylinder is  $31.4 \text{ cm}^2$ . The volume of the cylinder is  $157 \text{ cm}^3$ . What is the height of the cylinder?

**5cm**



## Week 11: Day 5

1) Calculate:

a)  $\frac{1}{2} + \frac{1}{3} + \frac{1}{4}$

b)  $\frac{3}{4} - \frac{1}{6}$

2) What was the original amount if...

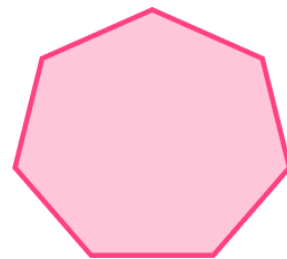
a) 15% is 21?

b) 70% is 49?

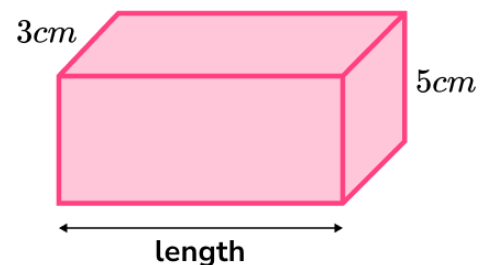
3) Make  $b$  the subject.

$$a^2 + b^2 = c^2$$

4) Determine the sizes of the interior and exterior angles of a regular heptagon (pictured). Give your answers to 1dp.



5) The volume of this cuboid is  $135 \text{ cm}^3$ . What is the missing edge length?



## Week 11: Day 5 Answers

1) Calculate:

a)  $\frac{1}{2} + \frac{1}{3} + \frac{1}{4} = \frac{13}{12}$       b)  $\frac{3}{4} - \frac{1}{6} = \frac{7}{12}$

2) What was the original amount if...

a) 15% is 21?  
**140**      b) 70% is 49?  
**70**

3) Make  $b$  the subject.

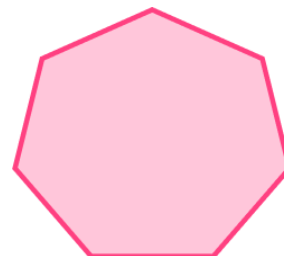
$$a^2 + b^2 = c^2$$

$$b = \sqrt{c^2 - a^2}$$

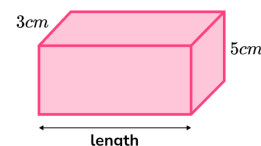
4) Determine the sizes of the interior and exterior angles of a regular heptagon (pictured). Give your answers to 1dp.

**Interior = 128.6°**

**Exterior = 51.4°**



5) The volume of this cuboid is  $135 \text{ cm}^3$ . What is the missing edge length? **9cm**



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