

## Week 8

### This week in a nutshell:

Q1 is targeted at mental arithmetic but also consider discussing calculator methods. These can then be used as a check. Students will be familiar with the facts needed for Q2 and should be able to attempt these questions independently. A reminder of expanding brackets first can help to introduce factorising as the opposite process in Q3. Having squared dotted paper available for drawing different quadrilaterals can help students to think carefully about shape properties in a more kinesthetic way for Q4. For Q5, ask students questions about how their methods work to further their understanding.

**Question 1:** Increasing/decreasing by a given percentage

**Question 2:** Proportionality and time

**Question 3:** Factorising

**Question 4:** Angles in quadrilaterals

**Question 5:** Addition/subtraction (column method)

The questions aim to develop and deepen understanding over the week. Due to the necessity of the topics covered this week, there is an emphasis on the interchangeability of command words, and language flexibility. It may be worth taking some extra time this week to make sure your students are developing their mathematical literacy.

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

**Question 1: Increasing/decreasing by a given percentage**

- Consider the question "decrease 80 by 10%" and discuss how each of the following methods work.

$$(a) 80 - (80 \div 10) = 72 \quad (b) (80 \div 100) \times (100 - 10) = 72 \quad (c) 80 \times (1 - 0.1) = 72$$

**Question 2: Proportionality and time**

- Challenge:** Calculate how old you will be by the end of today in months, in weeks, in days, in hours, in minutes and finally in seconds.

**Question 3: Factorising**

- $12x + 8$  can factorise to  $2(6x + 4)$  or  $4(3x + 2)$ . Using this example, discuss the instruction 'factorise fully'.

**Question 4: Angles in quadrilaterals**

- Task:** Using squared dotted paper draw 3 different squares, rectangles, trapeziums, parallelograms, kites and arrowheads. Think carefully about the properties of each shape as you draw them.

**Question 5: Addition/subtraction (column method)**

- Imagine you are a primary school teacher teaching subtraction using column method. Explain to your students how to calculate  $423 - 289$  &  $506 - 378$ . Now explain how the method you are using works.

## Week 8: Day 1

1) Increase 60 by 5%.

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2) How many minutes in four hours?

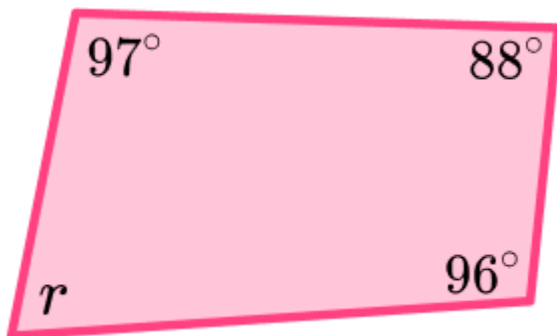
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3) Factorise fully:

$$5x + 15 =$$

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4) Work out the size of the angle marked  $r$ .



5) Complete the column addition:

$$\begin{array}{r} 3 \quad 7 \quad 4 \\ + \quad 2 \quad 5 \quad 8 \\ \hline \\ \hline \end{array}$$

## Week 8: Day 1 Answers

1) Increase 60 by 5%. 63

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2) How many minutes in four hours? 240

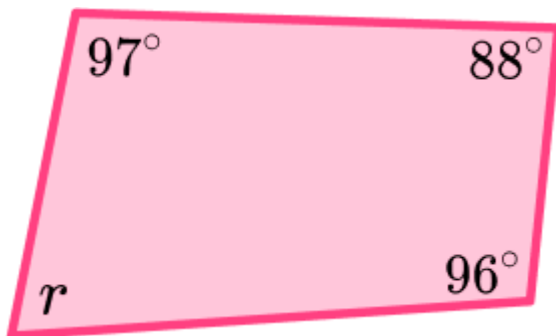
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3) Factorise fully:

$$5x + 15 = 5(x + 3)$$

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4) Work out the size of the angle marked  $r$ . 79°



5) Complete the column addition:

$$\begin{array}{r} 3 \quad 7 \quad 4 \\ + \quad 2 \quad 5 \quad 8 \\ \hline 6 \quad 3 \quad 2 \end{array}$$

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## Week 8: Day 2

1) Decrease 340 by 10%.

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2) How many weeks is fifty six days?

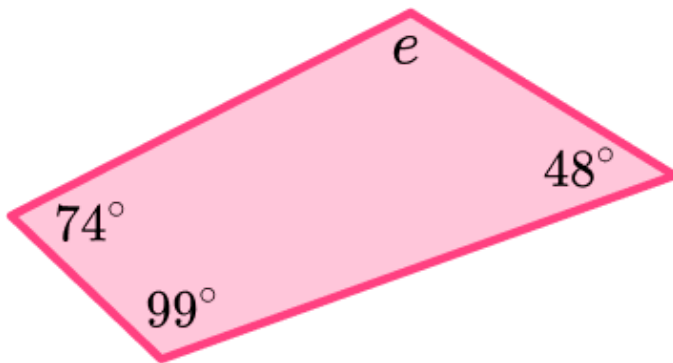
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3) Factorise fully:

$$6x - 21 =$$

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4) Work out the size of the angle marked  $e$ .



5) Complete the column subtraction:

$$\begin{array}{r} 613 \\ - 368 \\ \hline \\ \hline \end{array}$$

## Week 8: Day 2 Answers

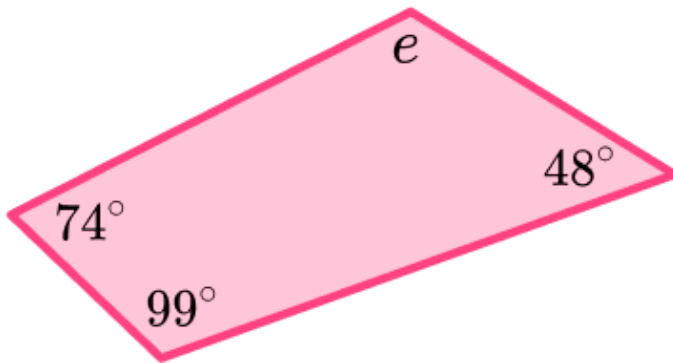
1) Decrease 340 by 10%. 306

2) How many weeks is fifty six days? 8

3) Factorise fully:

$$6x - 21 = 3(2x - 7)$$

4) Work out the size of the angle marked  $e$ .  $139^\circ$



5) Complete the column subtraction:

$$\begin{array}{r} 6 \quad 1 \quad 3 \\ - 3 \quad 6 \quad 8 \\ \hline 2 \quad 4 \quad 5 \end{array}$$

## Week 8: Day 3

1) Increase 24 by 25%.

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2) How many hours in eight days?

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3) Factorise fully:

$$14 - 35x =$$

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4) Given that the shape below is a parallelogram, determine the size of angle  $f$ .



5) Complete the column subtraction:

$$\begin{array}{r} 522 \\ 185 \\ + \quad 65 \\ \hline \\ \hline \end{array}$$

## Week 8: Day 3 Answers

1) Increase 24 by 25%. **30**

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2) How many hours in eight days? **192**

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3) Factorise fully:

$$14 - 35x = 7(2 - 5x)$$

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4) Given that the shape below is a parallelogram, determine the size of angle  $f$ .  **$99^\circ$**



5) Complete the column subtraction:

$$\begin{array}{r} 522 \\ 185 \\ + \quad 65 \\ \hline 772 \end{array}$$

## Week 8: Day 4

1) Decrease 350 by 20%.

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2) How many minutes in five and a half hours?

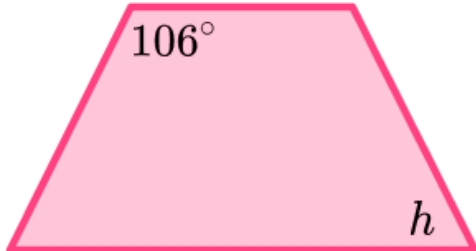
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3) Factorise fully:

$$8x + 7xy =$$

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4) Given that the shape below is an isosceles trapezium, determine the size of angle  $h$ .



5) Complete the column addition:

$$\begin{array}{r} 27.08 \\ + 11.45 \\ \hline \\ \hline \end{array}$$



## Week 8: Day 4 Answers

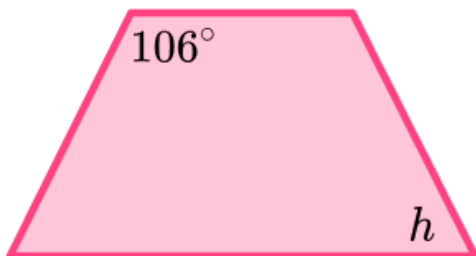
1) Decrease 350 by 20%. 280

2) How many minutes in five and a half hours? 330

3) Factorise fully:

$$8x + 7xy = x(8 + 7y)$$

4) Given that the shape below is an isosceles trapezium, determine the size of angle  $h$ .  $74^\circ$



5) Complete the column addition:

$$\begin{array}{r}
 27.08 \\
 + 11.45 \\
 \hline
 38.53
 \end{array}$$

## Week 8: Day 5

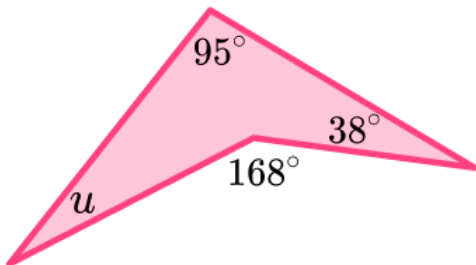
1) Increase 180 by 12.5%.

2) How many hours in one week?

3) Factorise fully:

$$4x - 12x^2 =$$

4) Work out the size of the angle marked  $u$ .



5) Complete the column subtraction:

$$\begin{array}{r} 38.17 \\ - 29.89 \\ \hline \\ \hline \end{array}$$

## Week 8: Day 5 Answers

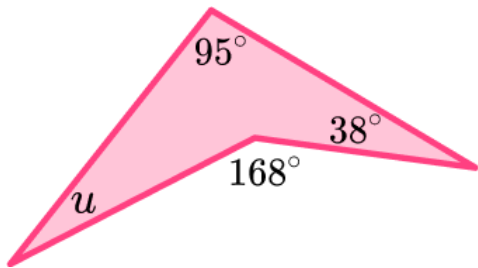
1) Increase 180 by 12.5%. 202.5

2) How many hours in one week? 168

3) Factorise fully:

$$4x - 12x^2 = 4x(1 - 3x)$$

4) Work out the size of the angle marked  $u$ .  $35^\circ$



5) Complete the column subtraction:

$$\begin{array}{r} 38.17 \\ - 29.89 \\ \hline 8.28 \end{array}$$

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