

Week 12

This week in a nutshell:

As in week 4, we see the notion of an algebraic equation to be solved explicitly. Questions are set in such a way that extension can be offered through method justification, or scaffolding issued in the form of function machines. It is possible to give students a range of values to use, or ask them to verify the equation given the answer. The aim is to give students the opportunity to develop fluency in how algebraic structures work so that when formal techniques are taught, they have the confidence to access all material.

Question 1: Testing primality

Question 2: Using powers of 10

Question 3: Factorising expressions

Question 4: Identity

Question 5: Solving equations with two steps

This week's ideas for class discussion include:

Question 1: **Testing primality**

- Why is it useful to be able to check if a number is prime?

Question 2: **Using powers of 10**

- How would these calculations change if our place value system was not based on powers of 10?

Question 3: **Factorising expressions**

- Is the expanded form or factorised form more useful? Why do you think this?

Question 4: **Identity**

- Does the concept of identity mean the same in maths as its common usage?

Question 5: **Solving equations with two steps**

- What strategies (visual, written, etc) can be used with questions like this?

Week 12: Day 1

- 1) Decide if 37 is a prime number. Give a reason for your answer.

- 2) Evaluate

$$3.25 \times 10^2$$

- 3) Factorise $3x + 6$

- 4) Make this mathematical statement correct by filling in the blanks.

$$3x + \underline{\hspace{2cm}} + 2x \equiv 9x$$

- 5) Work out the value of x that solves this equation:

$$2x + 5 = 17$$

Week 12: Day 1 Answers

- 1) Decide if 37 is a prime number. Give a reason for your answer.

Prime, only 1 and 37 divide 37

- 2) Evaluate

$$3.25 \times 10^2 = 325$$

- 3 Factorise $3x + 6$

$$3(x + 2)$$

- 4) Make this mathematical statement correct by filling in the blanks.

$$3x + \underline{4x} + 2x \equiv 9x$$

- 5) Work out the value of x that solves this equation:

$$2x + 5 = 17$$

$$x = 6$$

Week 12: Day 2

- 1) Decide if 87 is a prime number. Give a reason for your answer.
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- 2) Work out

$$1.08 \times 10^3$$

- 3) Factorise $5x - 15$
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- 4) Make this mathematical statement correct by filling in the blanks.

$$\underline{\hspace{2cm}} + 5z + 2x \equiv 2x + 7z$$

- 5) Work out the value of x that solves this equation:

$$5x - 6 = 29$$

Week 12: Day 2 Answers

- 1) Decide if 87 is a prime number. Give a reason for your answer.

Not prime, 87 is divisible by 1, 3, 29 and 87

- 2) Work out

$$1.08 \times 10^3 = 1080$$

- 3) Factorise $5x - 15$

$$5(x - 3)$$

- 4) Make this mathematical statement correct by filling in the blanks.

$$\underline{2z} + 5z + 2x \equiv 2x + 7z$$

- 5) Work out the value of x that solves this equation:

$$5x - 6 = 29$$

$$x = 7$$

Week 12: Day 3

1) Decide if 101 is a prime number. Give a reason for your answer.

2) Calculate

$$569 \div 10^2$$

3) Factorise $4x + 10$

4) Make this mathematical statement correct by filling in the blanks.

$$2x + 3x^2 \equiv 9x + x^2 - 7x + \underline{\hspace{2cm}}$$

5) Work out the value of x that solves this equation:

$$10x + 8 = 23$$

Week 12: Day 3 Answers

- 1) Decide if 101 is a prime number. Give a reason for your answer.

Prime, 101 is only divisible by 1 and 101

- 2) Calculate

$$569 \div 10^2 = 5.69$$

- 3) Factorise $4x + 10$

$$2(2x + 5)$$

- 4) Make this mathematical statement correct by filling in the blanks.

$$2x + 3x^2 \equiv 9x + x^2 - 7x + \underline{2x^2}$$

- 5) Work out the value of x that solves this equation:

$$10x + 8 = 23$$

$$x = 1.5$$

Week 12: Day 4

1) Decide if 147 is a prime number. Give a reason for your answer.

2) Work out

$$0.37 \times 10^5$$

3) Factorise $x^2 + 6x$

4) Make this mathematical statement correct by filling in the blanks.

$$3ab - \underline{\hspace{2cm}} + 4a \equiv 3ab$$

5) Work out the value of x that solves this equation:

$$3x - 5 = 22$$

Week 12: Day 4 Answers

- 1) Decide if 147 is a prime number. Give a reason for your answer.

Not prime, 147 is divisible by 1, 3, 7, 21, 49 and 147

- 2) Work out

$$0.37 \times 10^5 = 37000$$

- 3) Factorise $x^2 + 6x$

$$x(x + 6)$$

- 4) Make this mathematical statement correct by filling in the blanks.

$$3ab - \underline{4a} + 4a \equiv 3ab$$

- 5) Work out the value of x that solves this equation:

$$3x - 5 = 22$$

$$x = 9$$

Week 12: Day 5

1) Decide if 219 is a prime number. Give a reason for your answer.

2) Evaluate

$$112 \div 10^5$$

3) Factorise $2xy + 6xz - x$

4) Make this mathematical statement correct by filling in the blanks.

$$2y + \underline{\hspace{1cm}} - 3y + 2x \equiv 5x - \underline{\hspace{1cm}}$$

5) Work out the value of x that solves this equation:

$$13 = 21 - 4x$$

Week 12: Day 5 Answers

- 1) Decide if 219 is a prime number. Give a reason for your answer.

Not prime, $219 = 3 \times 73$ so is composite

- 2) Evaluate

$$112 \div 10^5 = 0.00112$$

- 3) Factorise $2xy + 6xz - x$

$$x(2y + 6z - 1)$$

- 4) Make this mathematical statement correct by filling in the blanks.

$$2y + 3x - 3y + 2x \equiv 5x - y$$

- 5) Work out the value of x that solves this equation:

$$13 = 21 - 4x$$

$$x = 2$$

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