

Week 5

This week in a nutshell:

Last week students found percentages of amounts. This week this topic takes a step further to percentage increase/decrease; ensure to promote a continuation of method here. Last week students were expanding brackets and this week they are doing the opposite; factorising. Help students to make the link between these two algebraic skills. Encourage students to write down their working out in Q3 and discuss different approaches to answering the question. When forming equations in Q4, the letter n has been used for the answers; it is worth pointing out that this is an arbitrary choice. You may want to print -4 to 4 axes for students to answer Q5, or allow them time to draw their own axes.

Question 1: Percentage increase/decrease

Question 2: Factorising

Question 3: Proportional reasoning

Question 4: Forming equations

Question 5: Plotting coordinates

This week's ideas for class discussion include:

Question 1: Percentage increase/decrease

- Simon says "40 increased by 10% is 44, therefore 44 decreased by 10% is 40". Is Simon correct?

Question 2: Factorising

- By factoring the expression $32x - 24$ using different factors fill in the blanks.
- $32x - 24 = 2(\square x - \square) = 4(\square x - \square) = 8(\square x - \square)$. Referencing this, what does 'fully factorise' mean?

Question 3: Proportional reasoning

- The teacher writes "4 doughnuts cost £2.80. How much do 6 doughnuts cost?". Three students do different calculations but all get the correct answer. Ahmed does $2.8 \div 4 \times 6 = 4.2$. Dali does $2.8 \div 2 \times 3 = 4.2$. Lara does $2.8 \div 2 + 2.8 = 4.2$. Explain the reasoning behind each calculation.

Question 4: Forming equations

- Follow these instructions. Think of a number. Double it. Add 10. Divide by 2. Subtract the number you chose. Write down your answer. Do this again for a different number. What do you notice?
- Can you write an equation to show how this maths magic trick works?

Question 5: Plotting coordinates

- Game: A student stands in the middle of the room/playground blindfolded. Another student directs them to a prize using coordinates where each unit represents one step.

Week 5: Day 1

1) Increase 50 by 20%

2) Factorise fully:

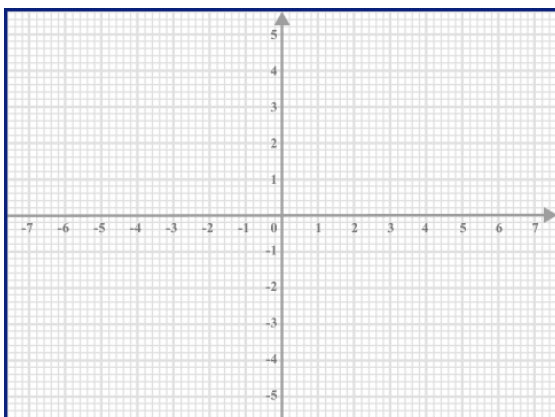
$$3x + 6$$

3) Five pens cost £1.50. How much do four pens cost?

4) Form an equation to represent the following information.
(you do not need to solve the equation)

"I am thinking of a number. When I add nine to this number, the result is seventeen."

5) On the axes, plot and label A(2, 3) and B(-1, 1)



Week 5: Day 1 Answers

- 1) Increase 50 by 20%

60

- 2) Factorise fully:

$$3x + 6 = 3(x + 2)$$

- 3) Five pens cost £1.50. How much do four pens cost?

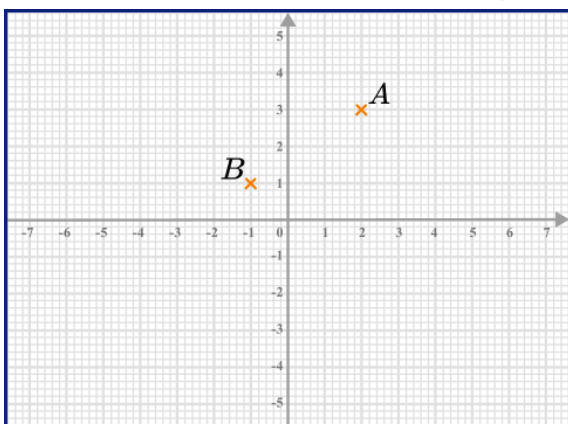
£1.20

- 4) Form an equation to represent the following information.
(you do not need to solve the equation)

"I am thinking of a number. When I add nine to this number, the result is seventeen."

$$n + 9 = 17$$

- 5) On the axes, plot and label A(2, 3) and B(-1, 1)



Week 5: Day 2

1) Decrease 60 by 30%

2) Factorise fully:

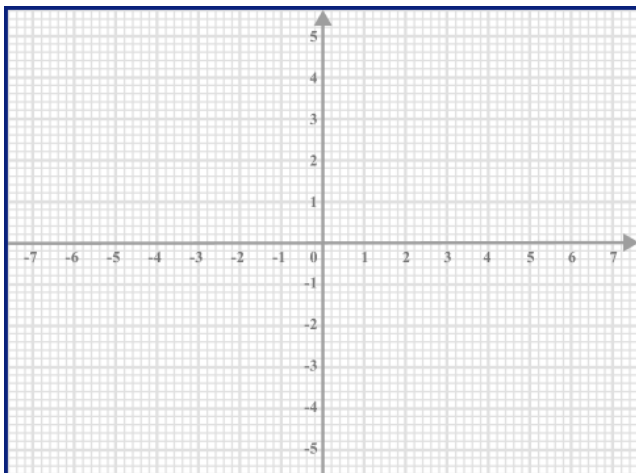
$$15x - 10$$

3) Eight bags of flour weigh 2kg. How much does three bags of flour weigh?

4) Form an equation to represent the following information.
(you do not need to solve the equation)

"I am thinking of a number. Three lots of this number is equal to twenty-one."

5) On the axes, plot and label A(-2, -3) and B(1, 4)



Week 5: Day 2 Answers

- 1) Decrease 60 by 30%

42

- 2) Factorise fully:

$$15x - 10 = 5(3x - 2)$$

- 3) Eight bags of flour weigh 2kg. How much does three bags of flour weigh?

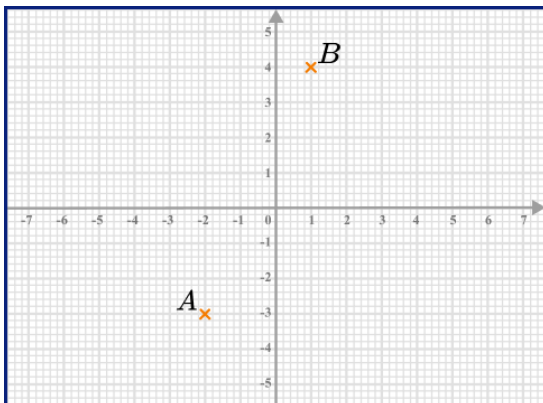
0.75kg or 750g

- 4) Form an equation to represent the following information.
(you do not need to solve the equation)

"I am thinking of a number. Three lots of this number is equal to twenty-one."

$$3n = 21$$

- 5) On the axes, plot and label A(-2, -3) and B(1, 4)



Week 5: Day 3

1) Increase 32 by 10%

2) Factorise fully:

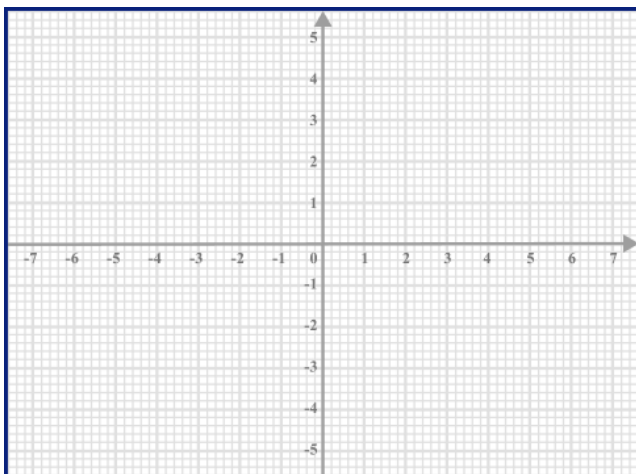
$$4 - 8b$$

3) Three canvases cost £45. How much does it cost to buy seven canvases?

4) Form an equation to represent the following information.
(you do not need to solve the equation)

"I am thinking of a number. When I divide this number by eight, the result is thirteen."

5) On the axes, plot and label A(0, 3) and B(4, -1)



Week 5: Day 3 Answers

- 1) Increase 32 by 10%
35.2

- 2) Factorise fully:

$$4 - 8b = 4(1 - 2b)$$

- 3) Three canvases cost £45. How much does it cost to buy seven canvases?

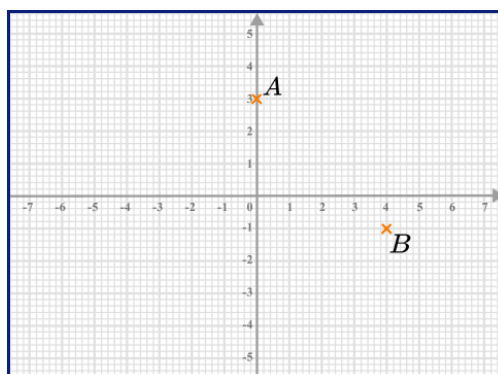
£105

- 4) Form an equation to represent the following information.
(you do not need to solve the equation)

"I am thinking of a number. When I divide this number by eight, the result is thirteen."

$$\frac{n}{8} = 13$$

- 5) On the axes, plot and label A(0, 3) and B(4, -1)



Week 5: Day 4

1) Increase 40 by 15%

2) Factorise fully:

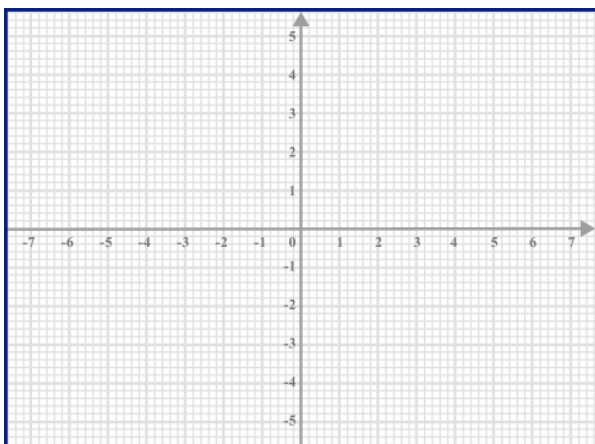
$$4a + 6b - 10c$$

3) Six bottles of cola cost £2.70. How much does it cost to buy fourteen bottles of cola?

4) Form an equation to represent the following information.
(you do not need to solve the equation)

"I am thinking of a number. I add five to this number, then multiply the result by two; the answer I get is sixteen."

5) On the axes, plot and label A(1.5, -1) and B(-4, 2)



Week 5: Day 4 Answers

- 1) Increase 40 by 15%

46

- 2) Factorise fully:

$$4a + 6b - 10c = 2(2a + 3b - 5c)$$

- 3) Six bottles of cola cost £2.70. How much does it cost to buy fourteen bottles of cola?

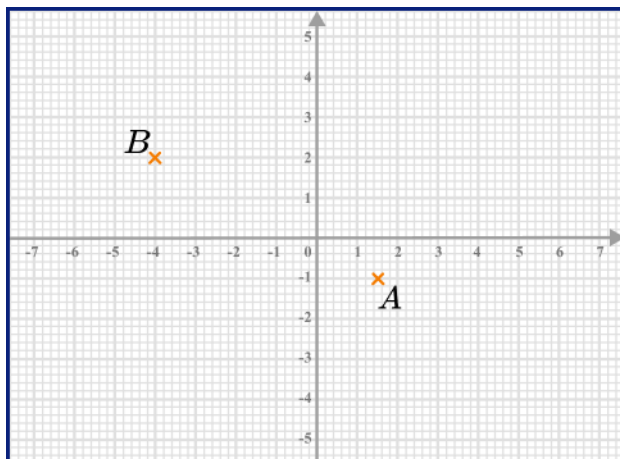
£6.30

- 4) Form an equation to represent the following information.
(you do not need to solve the equation)

"I am thinking of a number. I add five to this number, then multiply the result by two; the answer I get is sixteen."

$$2(n + 5) = 16$$

- 5) On the axes, plot and label A(1.5, -1) and B(-4, 2)



Week 5: Day 5

1) Decrease 68 by 10%

2) Factorise fully:

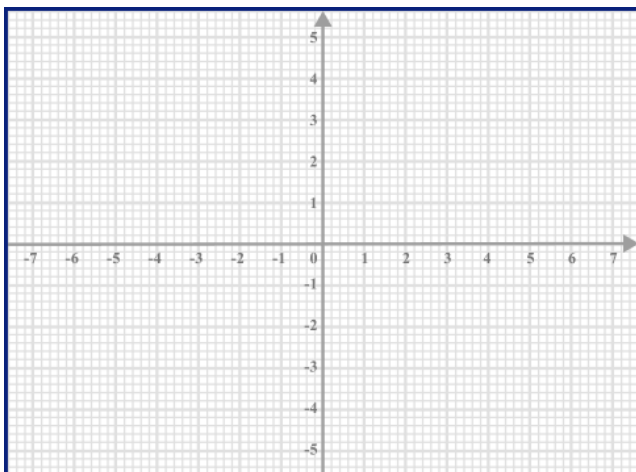
$$14x^2 - 8x$$

3) Four bags of sugar weigh 900g. How much does five bags of sugar weigh?

4) Form an equation to represent the following information.
(you do not need to solve the equation)

"I am thinking of a number. I add three to this number and then divide by a different number; the result is eleven."

5) On the axes, plot and label A(0, -2.5) and B(-1.5, 0)



Week 5: Day 5 Answers

- 1) Decrease 68 by 10%

61.2

- 2) Factorise fully:

$$14x^2 - 8x = 2x(7x - 4)$$

- 3) Four bags of sugar weigh 900g. How much does five bags of sugar weigh?

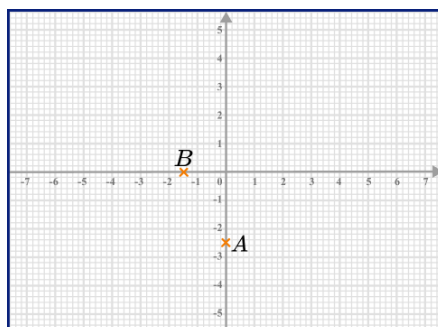
1125g

- 4) Form an equation to represent the following information.
(you do not need to solve the equation)

"I am thinking of a number. I add three to this number and then divide by a different number; the result is eleven."

$$\frac{n+3}{m} = 11$$

- 5) On the axes, plot and label A(0, -2.5) and B(-1.5, 0)



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