

## Week 5

### This week in a nutshell:

Again, a key focus is flexibility and representation. Included is coverage of the priority of operations (BIDMAS) for which a brief reminder may be necessary.

**Question 1:** Simplifying expressions

**Question 2:** BIDMAS

**Question 3:** Expanding brackets

**Question 4:** Stem and leaf diagrams

**Question 5:** Line graphs

For the data handling questions using line graphs, it is worth talking about the ideas of extrapolation and interpolation, and as such, the marking of answers should reflect this.

The self checking of expanding brackets should be encouraged, using factorisation as the inverse.

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

**Question 1: Simplifying expressions**

- What are the similarities when dealing with division and fractions in algebra? Why do you think that is?

**Question 2: BIDMAS**

- Why might the operations be done in this order?
- What is BIDMAS called elsewhere around the world? (PEMDAS, for example)

**Question 3: Expanding brackets**

- How do you think expanding brackets relates to BIDMAS?
- Can you think of a way to show why expanding brackets works?

**Question 4: Stem and leaf diagrams**

- How does the name stem and leaf help you understand what the diagram represents?

**Question 5: Line graphs**

- Why do you think we have to be careful using the connecting lines between data points to make predictions?

## Week 5: Day 1

1) Simplify

a)  $2y \times 7z$

b)  $a \times 3b \times 4c$

2) Evaluate

a)  $10 \div 2 + 7$

b)  $16 - 4 \times 3$

3) Expand

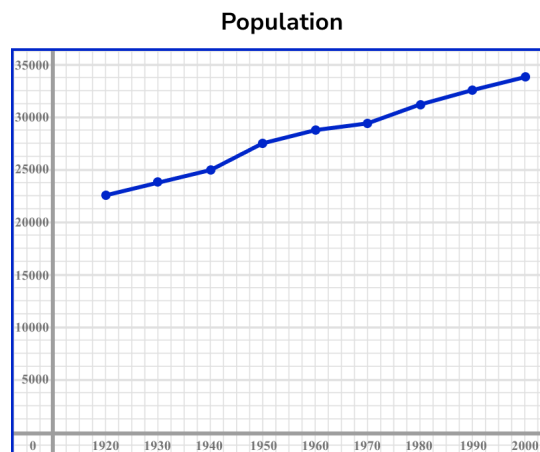
a)  $2(a + 3)$

b)  $3(x - 7)$

4) In the stem and leaf diagram, what is the value of the highlighted number?

Key: 5		4 means 54		
0	2	4	5	
1	1	1	6	8
2	5	9		
3	2	2	7	

5) The line graph shows the population of a small town over a period of 80 years. Estimate the population in 1970.



## Week 5: Day 1 Answers

1) Simplify

a)  $2y \times 7z = 14yz$

b)  $a \times 3b \times 4c = 12abc$

2) Evaluate

a)  $10 \div 2 + 7 = 12$

b)  $16 - 4 \times 3 = 4$

3) Expand

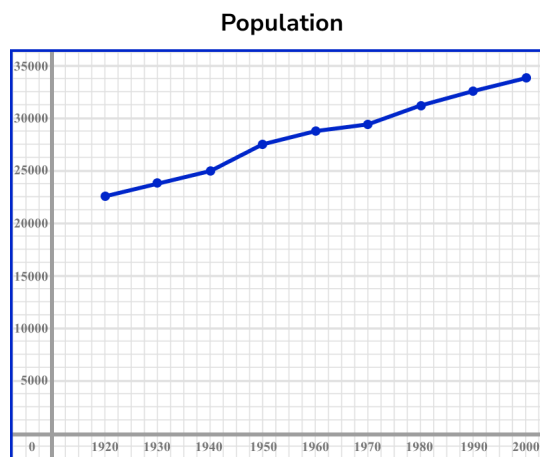
a)  $2(a + 3) = 2a + 6$

b)  $3(x - 7) = 3x - 21$

4) In the stem and leaf diagram, what is the value of the highlighted number? **29**

Key: 5		4 means 54			
0	2	4	5		
1	1	1	6	8	
2	5	9			
3	2	2	7		

5) The line graph shows the population of a small town over a period of 80 years. Estimate the population in 1970. **28000 - 30000**



## Week 5: Day 2

1) Simplify

a)  $8x^3 \div 2x$

b)  $5a \times 3b - 4ab$

2) Evaluate

a)  $8 \times 7 - 10 \div 2$

b)  $18 - 6 \div 2 + 4$

3) Expand

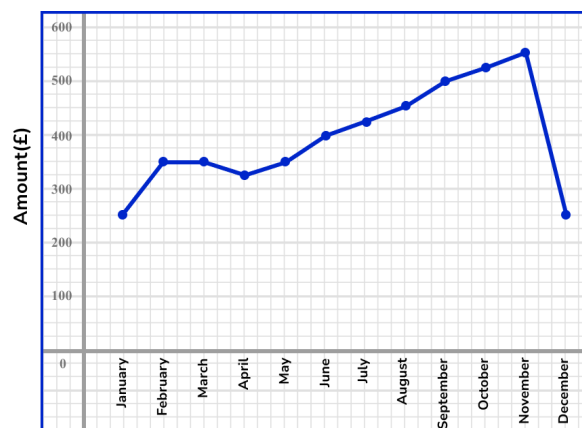
a)  $8(2x + 5)$

b)  $-4(5b - 1)$

4) For the stem and leaf diagram below, what is the range?

Key: 3		4 means 34		
1	3	5	5	
2	1	1	6	8
3	5	8		
4	3	6	7	

5) The line graph shows the amount an investment is worth during a 12 month period? In which month did the investment have its greatest value?



## Week 5: Day 2 Answers

1) Simplify

a)  $8x^3 \div 2x = 4x^2$

b)  $5a \times 3b - 4ab = 11ab$

2) Evaluate

a)  $8 \times 7 - 10 \div 2 = 51$

b)  $18 - 6 \div 2 + 4 = 19$

3) Expand

a)  $8(2x + 5) = 16x + 40$

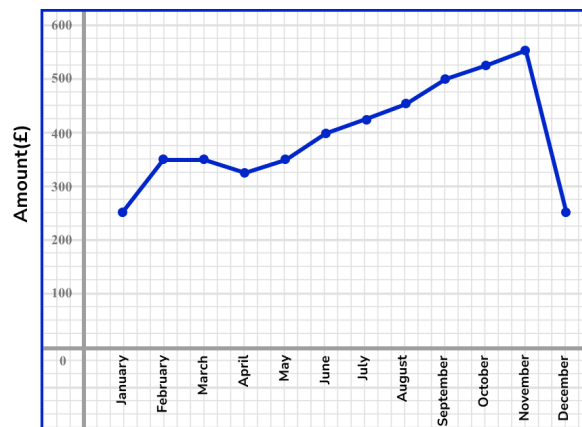
b)  $-4(5b - 1) = -20b + 4$

4) For the stem and leaf diagram below, what is the range? **34**

Key: 3   4 means 34	
1	3 5 5
2	1 1 6 8
3	5 8
4	3 6 7

5) The line graph shows the amount an investment is worth during a 12 month period? In which month did the investment have its greatest value?

**November**



## Week 5: Day 3

1) Simplify

a)  $\frac{25x^7}{5x^2}$

b)  $5a^2 + 3a \times 4a$

2) Evaluate

a)  $3 \times (23 - 8)$

b)  $19 + 4^2 \div 8$

3) Expand

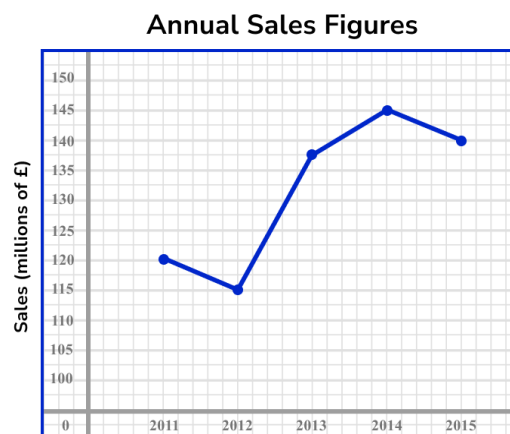
a)  $y(y + 4)$

b)  $2x(5x - 1)$

4) The stem and leaf diagram shows the ages of a group of people. What is the median age?

Key: 5	4 means 54
1	0 1 7 8
2	3 9
3	2 6 7

5) Based on the line graph, what was the value of sales for this company in 2014?



## Week 5: Day 3 Answers

1) Simplify

a)  $\frac{25x^7}{5x^2} = 5x^5$

b)  $5a^2 + 3a \times 4a = 17a^2$

2) Evaluate

a)  $3 \times (23 - 8) = 45$

b)  $19 + 4^2 \div 8 = 21$

3) Expand

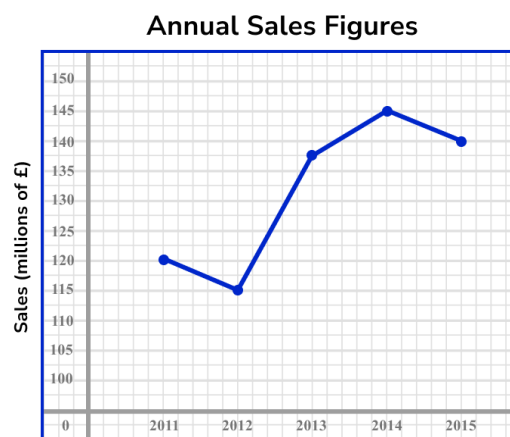
a)  $y(y + 4) = y^2 + 4y$

b)  $2x(5x - 1) = 10x^2 - 2x$

4) The stem and leaf diagram shows the ages of a group of people. What is the median age? **23**

Key: 5	4 means 54
1	0 1 7 8
2	3 9
3	2 6 7

5) Based on the line graph, what was the value of sales for this company in 2014? **£145 million**



## Week 5: Day 4

1) Simplify

a)  $\frac{8x^9}{(2x)^3}$

b)  $30a^4 \div 5a^2 + a \times 7a$

2) Evaluate

a)  $(7 + 3) \times (7 - 3)$

b)  $(23 - 5) \div 3^2$

3) Expand and simplify

a)  $4(x + 1) + 3(x + 2)$

b)  $2x(x + 3) - x(x + 1)$

4) The stem and leaf diagram shows the ages of a group of people. What age is the mode?

Key: 1		4 means 14			
1	0 1 6 8				
2	4 4 4 5 9				
3	2 3 3 7				

5) Based on this line graph, how many books were read by this person during the final four months of the year?





## Week 5: Day 4 Answers

1) Simplify

a)  $\frac{8x^9}{(2x)^3} = x^6$

b)  $30a^4 \div 5a^2 + a \times 7a = 13a^2$

2) Evaluate

a)  $(7 + 3) \times (7 - 3) = 40$

b)  $(23 - 5) \div 3^2 = 2$

3) Expand and simplify

a)  $4(x + 1) + 3(x + 2) = 7x + 10$

b)  $2x(x + 3) - x(x + 1) = x^2 + 5x$

4) The stem and leaf diagram shows the ages of a group of people. What age is the mode? **24**

Key: 1   4 means 14	
1	0 1 6 8
2	4 4 4 5 9
3	2 3 3 7

5) Based on this line graph, how many books were read by this person during the final four months of the year? **16**



## Week 5: Day 5

1) Simplify

a)  $\frac{3x^2 - 2x^2}{x^2}$

b)  $3a \times 5ab \times 2abc$

2) Evaluate

a)  $(7 + 2^3 \div 4)^2$

b)  $(4^2 + 3^2) \div 5^2$

3) Expand and simplify

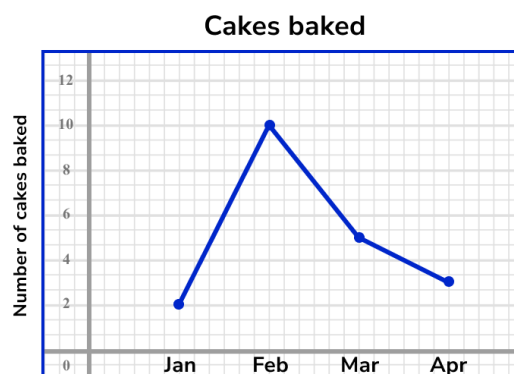
a)  $3(x + 5) + 2(2x - 7)$

b)  $y(3y - 4) - 3(2y - 1)$

4) The stem and leaf diagram shows the heights of a group of people. How many people were surveyed?

Key: 13   6 means 136cm	
15	3 5 5
16	1 1 6 8
17	5 8
18	3 6 7

5) Based on the line graph, how many more cakes were baked in February than April?



## Week 5: Day 5 Answers

1) Simplify

a)  $\frac{3x^2 - 2x^2}{x^2} = 1$

b)  $3a \times 5ab \times 2abc = 30a^3b^2c$

2) Evaluate

a)  $(7 + 2^3 \div 4)^2 = 81$

b)  $(4^2 + 3^2) \div 5^2 = 1$

3) Expand and simplify

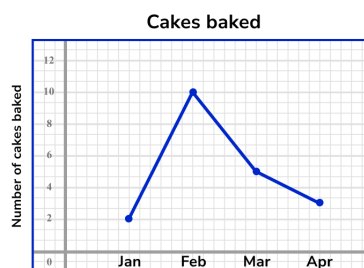
a)  $3(x + 5) + 2(2x - 7) = 7x + 1$

b)  $y(3y - 4) - 3(2y - 1) = 3y^2 - 10y + 3$

4) The stem and leaf diagram shows the heights of a group of people. How many people were surveyed? **12**

Key: 13		6 means 136cm	
15	3	5	5
16	1	1	6 8
17	5	8	
18	3	6	7

5) Based on the line graph, how many more cakes were baked in February than April? **7**



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