Review 2A

1 Work out the following.

a) $(+7) + (+5) - (+6) - (+3)$

b) $(-4) - (-6) + (-9) - (+7)$

c) $(-5) \times (+4) \times (-3) \times (+6)$

d) $(+18) \div (+6) \times (-3) \times (+2)$

2 Find the prime factors of the following numbers. Express each number as a product of prime numbers, using indices when needed.

a) 2310

b) 1440

3 Evaluate the following without using a calculator.
Give positive and negative roots.

a) $\sqrt{\frac{4}{9}}$

b) $\sqrt{\frac{81}{25}}$

c) $\sqrt{\frac{144}{289}}$

4 Simplify the following expressions using the correct order of operations.

a) $11a^2 + 3(4a + 2) - 13a$

b) $9b - (7b^2 - 11) + b$

c) $6(7c - 2) + 4(c^2 - 8)$

5 Solve the following equations.

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

b) $\frac{2x - 2}{3} = 4$

✪ **c)** $3x + 1 = 2$

6 I have ten full boxes of counters and one box with 12 counters missing.
There are 153 counters altogether. How many counters are in each full box?

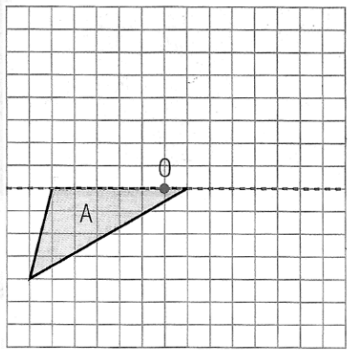
7 **a)** Using a protractor, draw an angle of 50°.

b) Using a pair of compasses, bisect your angle. Leave any construction lines visible.

8 This diagram shows a triangle labelled *A*.
Copy the diagram on to squared paper and on the same grid draw the images of the triangle after the following transformations in turn:

a) a rotation by 180° about *O*
(label this image *B*)

b) then a reflection in the mirror line
(label this image *C*).



9 25 students in a class are asked how many cars their family has.
The table shows the results.

Number of cars	0	1	2	3	4
Frequency	6	9	7	2	1

a) Calculate the mean, median and modal number of cars per family.

b) Calculate the range of the data.

10 Find the new temperature for each of the following. You may need to draw a number line.

a) The temperature was –13.58 °C and rises by 19.1 °C.

b) The temperature was –1.66 °C and falls by 7.7 °C.

c) The temperature was 2.9 °C and falls by 9.89 °C.

Review 2B

1 Find the highest common factor of the following numbers.

a) 4, 12, 16

b) 21, 42, 56

c) 36, 54, 108

2 Find the lowest common multiple of the following numbers.

a) 3, 8, 16

b) 4, 7, 10

c) 3, 5, 7

3 Without using a calculator, work out the positive and negative square roots of the following decimals.

a) 0.81

b) 1.21

c) 2.25

4 Without using a calculator if possible, work out the following.

a) $\sqrt[3]{125}$

b) $\sqrt[3]{512}$

c) $\sqrt[3]{1331}$

5 Simplify the following expressions using the correct order of operations.

a) $6i + i - 3(2i - 9) + 8i^4$

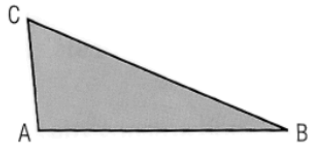
b) $6(j + 2) + 5(j^2 - 2) - 7(2j - 4)$

6 A number has 7 subtracted from it and the result is multiplied by 6. The answer is the same as doubling the number, subtracting 15 and then multiplying by 4.

a) Construct an equation from the information given.

b) Solve the equation to find the number.

7 Draw a triangle ABC similar to this.



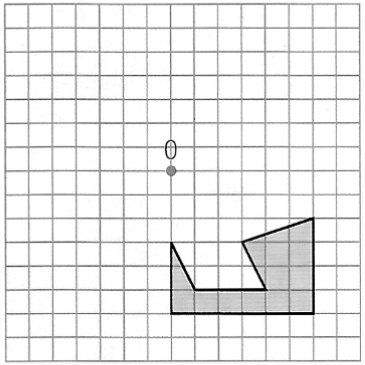
Using a pair of compasses:

a) construct the perpendicular bisector of AC

b) construct the perpendicular bisector of BC.

c) Use your constructions in parts **a)** and **b)** to construct a circle that passes through A, B and C.

8 Copy the shape below on to squared paper and draw the image after a rotation by 270° clockwise about the centre of rotation O.



9 Two bus companies publish data about how punctual their buses are. The data, which shows how many minutes late the buses are, is given in the table.

	Mean	Median	Mode	Range
Company A	10	10	1	28
Company B	10	10	10	0

a) Which bus company is more consistent? Explain your answer.

b) Both companies want to promote their service. Write a short sentence that each company might use for an advertising campaign.

c) Which company's buses do you think perform better? Justify your answer.

10 A plane is flying 9350 metres above the *bottom* of the sea. It drops a float to the surface of the sea. A submarine is directly below the plane.

a) The float falls 7542 metres. How deep is the sea at that point?

b) The submarine is 670 metres below the surface. How far is the plane above it?