Intermediate 2 – Homework 1

Non-calculator section:

1. Expand the brackets and simplify
   (a) $(3x - y)^2$ (b) $(x - 4)(x^2 + 5x - 2)$

2. A line has equation $y = 3x - 2$.
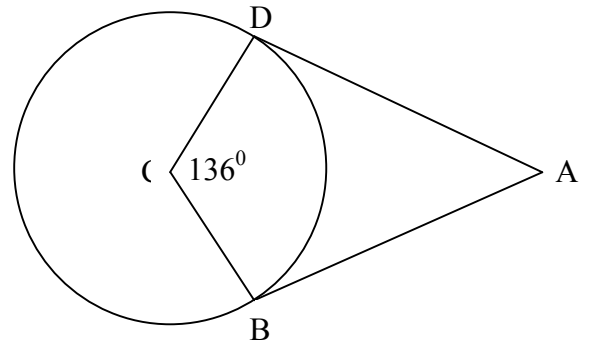
   (a) Copy and complete the table below for this line.

x	3	0	-2
y			

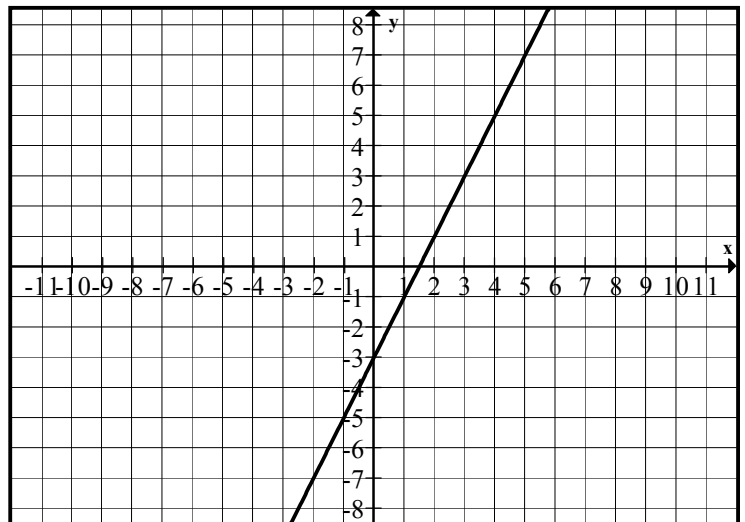   (b) Write down the gradient of this line.

3. The diagram opposite shows the design for an
   earring.
   The design consists of a kite ABCD and a circle
   centre C. AB and AD are tangents.

   Calculate the size of angle BAD.

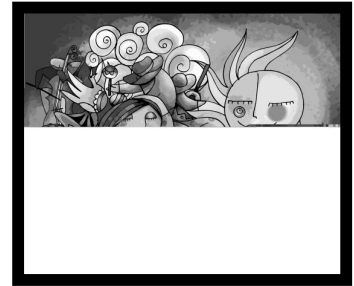4. Find the equation of the line
   shown opposite.

5. (a) Factorise $2x^2 + 8x$

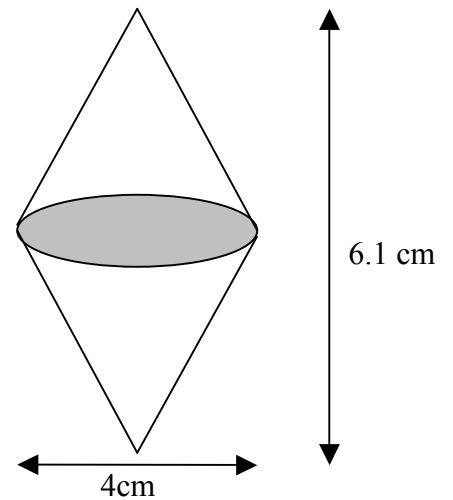   (b) Hence simplify $\dfrac{2x^2 + 8x}{2x^2 - 32}$

6. A painting valued at £16 000 in 2008 is expected to increase in value at a rate of 5.5% per annum for each of the next 4 years.

   Calculate the expected value of the painting in 4 years time.
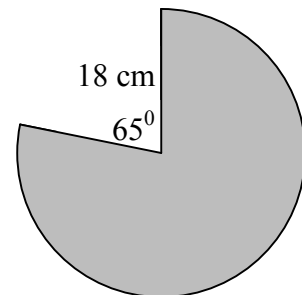   **Give your answer to 3 significant figures.**

7. A fisherman makes a cork float from two identical cones of diameter 4 cm with a common base.

   Calculate the volume of this float.

   6.1 cm

   4cm

8. The diagram opposite shows the sector of a circle with radius 18 centimetres.

   Calculate the area of this sector.

   18 cm

   65^0

9. A storage bin has a cross-section in the shape of a rectangle and a semi-circle.

   Calculate the volume of this storage bin.

   30 cm

   80 cm

   62 cm