

**HIGHER TIER  
MINI PRACTICE EXAM 2**

**NON-CALCULATOR  
20 MINUTES ALLOWED**

1.

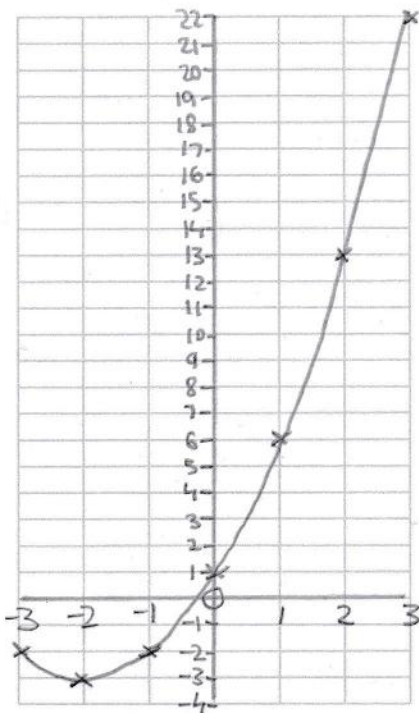
Expand and simplify  $4(x + 5) - 3(2x - 3)$

$$4x + 20 - 6x + 9 = \underline{-2x + 29}$$

(2)

2.

Plot the graph  $y = x^2 + 4x + 1$  for  $x = -3$  to  $3$  on the grid below.



x	-3	-2	-1	0	1	2	3
y	-2	-3	-2	1	6	13	22

$$(-3)^2 + 4(-3) + 1 = -2$$

$$(-2)^2 + 4(-2) + 1 = -3$$

$$(-1)^2 + 4(-1) + 1 = -2$$

$$0^2 + 4(0) + 1 = 1$$

$$1^2 + 4(1) + 1 = 6$$

$$2^2 + 4(2) + 1 = 13$$

$$3^2 + 4(3) + 1 = 22$$

(4)

3.

Megan makes bracelets.

Each bracelet requires 8 beads and 11 centimetres of string.

Megan bought a box containing 350 beads.

She also bought three rolls of string.

The rolls of string are 1.5 metres long.

Work out the maximum number of bracelets Megan can make with the materials she has.

Beads:  $350 \div 8 = 43 \text{ r } 6$

$$150 \times 3 = 450 \text{ cm}$$

String:  $450 \div 11 = 40 \text{ r } 10$

$$\begin{array}{r} 043 \text{ r } 6 \\ 8 \overline{)350} \end{array}$$

$$\begin{array}{r} 040 \text{ r } 10 \\ 11 \overline{)450} \end{array}$$

40 bracelets

(3)

4.

Shane weighs 56 kilograms, to the nearest kilogram.

Write down an error interval for Shane's weight.

$$55.5 \leq x < 56.5$$

(2)

4.

Express  $\sqrt{27} + 7\sqrt{3} - 2\sqrt{48}$  in the form  $a\sqrt{3}$  where  $a$  is an integer.

$$\sqrt{27} = \sqrt{9} \times \sqrt{3} = 3\sqrt{3}$$

$$2\sqrt{48} = 2\sqrt{16} \times \sqrt{3} = 8\sqrt{3}$$

$$3\sqrt{3} + 7\sqrt{3} - 8\sqrt{3} = \underline{2\sqrt{3}}$$

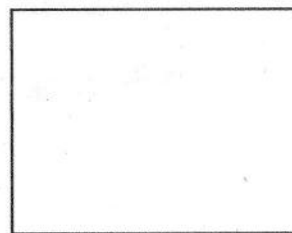
(4)

5.

The shape below is a square.

Show that the area of the square is  $1156 \text{ cm}^2$ .

$7x - 15 \text{ cm}$



$2x + 20 \text{ cm}$

$$\begin{array}{r} 7x - 15 = 2x + 20 \\ -2x \quad -2x \\ \hline 5x - 15 = 20 \end{array}$$

$$\begin{array}{r} 5x - 15 = 20 \\ +15 \quad +15 \\ \hline 5x = 35 \end{array}$$

$$\begin{array}{r} 5x = 35 \\ \div 5 \quad \div 5 \\ \hline x = 7 \end{array}$$

$$2 \times 7 + 20 = 34 \text{ cm}$$

$$\text{Area} = 34 \times 34 = \underline{1156 \text{ cm}^2}$$

$$\begin{array}{r} 34 \\ \times 34 \\ \hline 136 \\ 1020 \\ \hline 1156 \end{array}$$

(5)