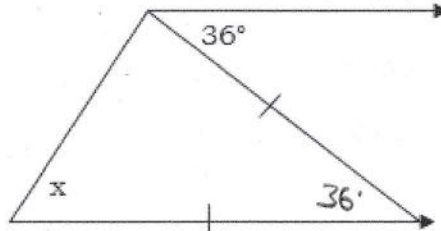


**HIGHER TIER
MINI PRACTICE EXAM 12**

**NON-CALCULATOR
20 MINUTES ALLOWED**

1.
Find x . Give reasons for your answer.



$$180 - 36 = 144$$

$$144 \div 2 = 72$$

$$x = 72^\circ$$

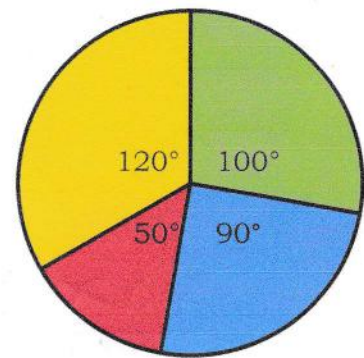
because alternate angles are equal and angles in a triangle add to 180°

(3)

2.
Jasmine has a biased spinner with four sections, pictured to the right.

(a) Work out the probability that the spinner lands on blue.
Give your answer as a decimal.

$$\frac{90}{360} = \frac{1}{4} = 0.25 \quad (2)$$



(b) Jasmine is going to use the spinner at a fair.
Each player will pay £1 to spin.
If the spinner lands on red, the player wins £5.
If the spinner lands on green, the player wins their £1 back.
If the spinner lands on any other section, the player wins nothing.

900 people are going to play the game.
Do you expect Jasmine to make a profit or a loss?

$$900 \times £1 = £900 \text{ raised}$$

$$\begin{array}{r} 0125 \\ 36 \overline{) 4500} \end{array}$$

$$\text{Pink} = \frac{50}{360} \times 900 = \frac{45000}{360} = \frac{4500}{36} = 125 \times £5 = £625$$

$$\text{Green} = \text{Pink} \times 2 = 250 \times £1 = £250$$

$$625 + 250 = £875$$

$$£900 - £875 = \underline{\underline{£25 \text{ profit}}}$$

(4)

3.

Solve $\frac{3}{x-2} = \frac{2(2x+1)}{3x}$

$$\frac{9x}{x-2} = 4x+2$$

$$9x = (4x+2)(x-2)$$

$$9x = 4x^2 + 2x - 8x - 4$$

$$9x = 4x^2 - 6x - 4$$

$$0 = 4x^2 - 15x - 4$$

$$\begin{array}{r} x-16 \\ + -15 \end{array}$$

$$4x^2 - 16x + x - 4$$

$$4x(x-4) + 1(x-4)$$

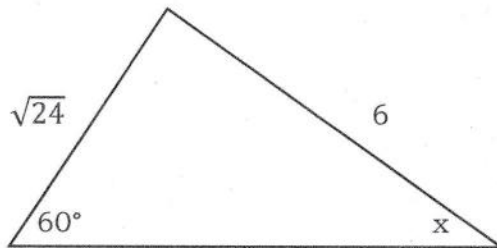
$$(4x+1)(x-4) = 0$$

$$x = -\frac{1}{4} \text{ or } 4$$

(5)

4.

Find x.



$$\frac{\sin x}{\sqrt{24}} = \frac{\sin 60}{6} \quad \left(\sin 60 = \frac{\sqrt{3}}{2} \right)$$

$$\sin x = \frac{\sqrt{3} \times \sqrt{24}}{2 \times 6}$$

$$= \frac{\sqrt{72}}{12}$$

$$\left(\begin{array}{l} \sqrt{72} = \sqrt{36} \times \sqrt{2} \\ = 6\sqrt{2} \end{array} \right)$$

$$= \frac{6\sqrt{2}}{12}$$

$$= \frac{\sqrt{2}}{2}$$

$$\sin^{-1}\left(\frac{\sqrt{2}}{2}\right) = \underline{45^\circ}$$

(6)