Year 11 : Numeracy Paper 2 (Calculator Allowed)

Mock Exam Prep : Sheet 2

1) The table shows the times taken for a number of people to do a task

Time (t mins)	Frequency	Mid Point
$0 < t < 8$	3	4
$8 \leq t < 16$	7	12
$16 \leq t < 24$	18	20
$24 \leq t < 32$	6 / 34	28

Calculate an estimate for the mean time taken to do the task. (Hint : create a mid-point column)

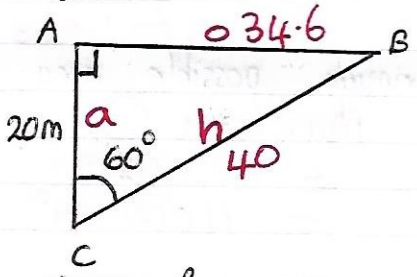
$$\approx \frac{(3\times4)+(7\times12)+(18\times20)+(6\times28)}{34}$$

$$= \frac{12+84+360+168}{34} = \frac{624}{34} \approx 18.4 \text{ min}$$

$0.4 \times 60 = 24$ sec

$\approx$ 18 mins 24 secs

2) A farmer wants to erect a fence around the triangular field shown below.



- Fencing costs £6 per metre
- The farmer buys £550 worth of fencing.

Has the farmer bought enough fencing?
If so, how much fencing is left over?
If not, by how much is the farmer short?

AB $\quad \tan 60^\circ = \frac{AB}{20}$

$20 \tan 60^\circ = AB$

$34.6\text{m} = AB$

BC / $\quad \cos 60^\circ = \frac{20}{BC}$

$BC = 20 / \cos 60^\circ$

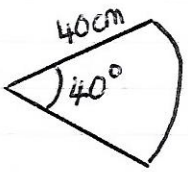
$\therefore$ Length of fencing needed $\quad BC = 40\text{m}$

$= 34.6 + 40 + 20 = 94.6\text{m}$.

$\therefore$ £550 will buy you $\frac{550}{6} = 91.7\text{M}$ of fencing.

$\therefore$ No, not enough by 2.9m

3) The diagram shows a metal plate in the form of a sector of a circle



a) Calculate the area of the plate.

$A = \frac{40}{360}\pi r^2 = \frac{1}{9} \times 3.14 \times 40 \times 40 = 558.2\,cm^2$

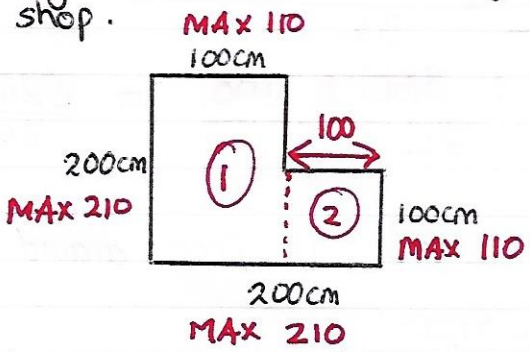
b) Calculate the perimeter of the plate.

$P = 40 + 40 + \frac{40}{360}\pi D$

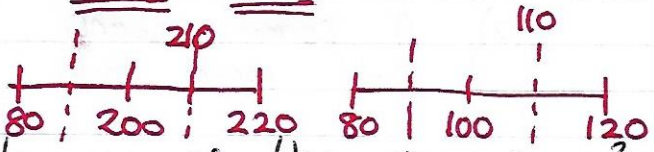
$P = 80 + \left(\frac{1}{9} \times 3.14 \times 80\right)$ $\quad P = 80 + 27.9$

$P = 107.9\,cm$

4) The diagram shows a large sign used as a logo outside a shop.



All measurements are to the nearest 20 cm.



a) Calculate the maximum possible area of the sign in cm^2.

Max Area (1)

$110 \times 210 = 23\,100\,cm^2$

Max area (2)

$= 100 \times 110 = 11\,000\,cm^2$

$\therefore$ Max area of sign $= 23\,100 + 11\,000$

$= 34\,100\,cm^2$

b) The sign needs to be painted on both sides.

- A tin of paint has a coverage of $15\,000\,cm^2$ measured to the nearest $1000\,cm^2$.

Min coverage = $14\,500\,cm^2$

Calculate the maximum number of tins that could be needed to paint both sides of the sign.

$$\text{Max no. of tins} = \frac{\text{MAX area of shape}}{\text{Min coverage for a tin}}$$

$$= \frac{34\,100}{14\,500} = 2.35$$

$\therefore$ 3 tins may be needed.