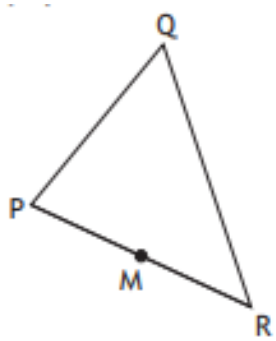
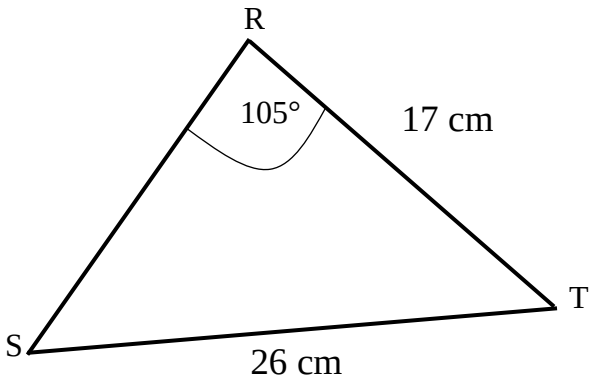
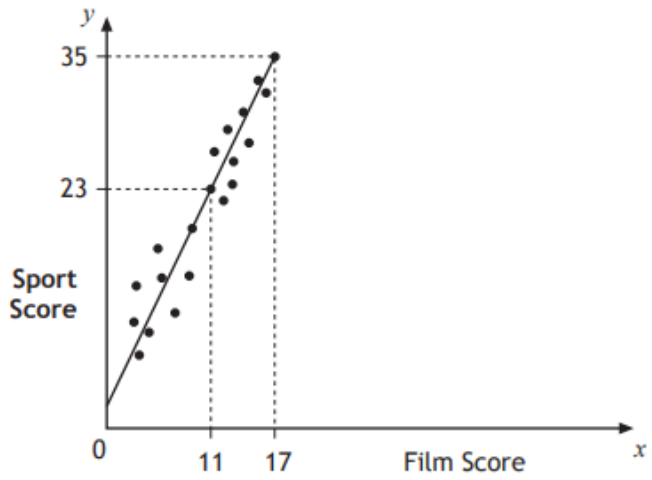
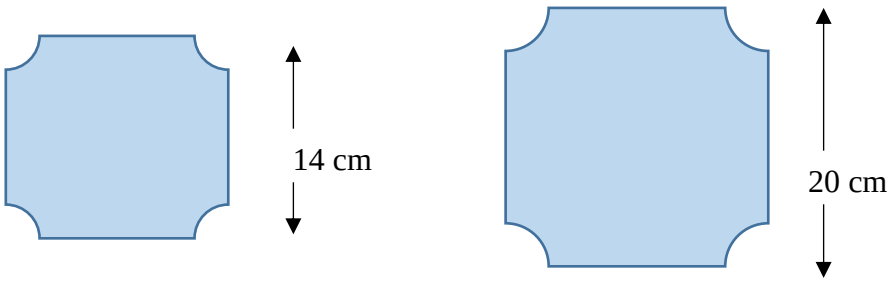
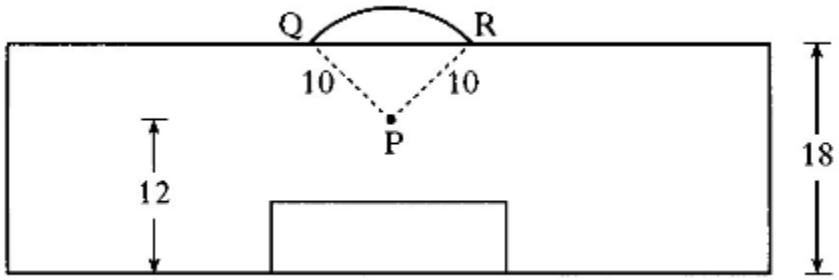
	Calculator Prelim Revision 3	**50**
1	In 2016 a house was valued at £130 000. This house is expected to appreciate by 3.7% per year. What is the expected value of this house in 2020?	**3**
2	Midday temperatures in St Andrews were recorded over a nine-day period. The temperatures in $°C$ were 14 11 9 17 11 12 8 10 13 Calculate the median and semi-interquartile range for these temperatures	**3**
3	In the triangle PQR shown below $\overrightarrow{QP} = \begin{pmatrix} -3 \\ -4 \end{pmatrix}$ and $\overrightarrow{PR} = \begin{pmatrix} 6 \\ -2 \end{pmatrix}$  (a) Express $\overrightarrow{QR}$ in component form M is the midpoint of PR, (b) express $\overrightarrow{MQ}$ in component form	**1** **2**
4	For the triangle shown below. Calculate the size of angle S  	**3**
5	Jupiter's largest moon Io has a diameter of approximately 1823 km. Calculate the volume of Io. Give your answer in scientific notation correct to **two significant figures.**	**3**

6	Teams in a quiz answer questions on film and sport/ The scattergraph below shows the scores of some of the teams  The line of best fit is drawn as shown. (a) Find the equation of this line of best fit (b) Use this equation to estimate the sports score for a team member with a film score of 15	**3** **1**
7	The height in centimetres of 6 sunflowers is given below $149 \quad 155 \quad 165 \quad 159 \quad 160 \quad 172$ For this sample, calculate the mean and the standard deviation	**4**
8	These two shapes are mathematically similar.  The height of the smaller shape is $14\ cm$ and the area is $26\ cm^2$ The height of the larger shaper is $20\ cm$. Calculate the area of the larger shape.	**3**

9	The diagram shows the penalty area in a football pitch.  The penalty spot is marked at point P QR is an arc of a circle with centre P with a radius of 10 yards The width of the penalty area is 18 yards. The distance of the penalty spot from the goal line is 12 yards (a) Calculate the size of angle QPR (b) Calculate the length of arc QR	**3** **3**
10	Whilst on holiday in the US Ella paid \$450.87 for a laptop. This price included 13% sales tax. What was the price of the laptop before sales tax was added?	**3**
11	Algebraically solve the system of equations $5x + 2y = 6$ $3x + 8y = 7$	**3**
12	Sketch the graph of $y = (x + 1)(x - 5)$ On your sketch clearly show the points of intersection with the x-axis and the y-axis and the coordinates of the turning point.	**3**
13	Solve the equation $5\cos x° + 1 = -3, \quad 0 \leq x \leq 360°$	**3**
14	Simplify $15a^3 \times 2a^5 \times \frac{1}{6}a^{-4}$	**2**
15	The weight, *W* kilograms, of a giraffe is related to its age, *m* months, by the formula. $W = \frac{1}{4}(m^2 - 4m + 272)$ At what age will a giraffe weigh 83 kilograms?	**4**