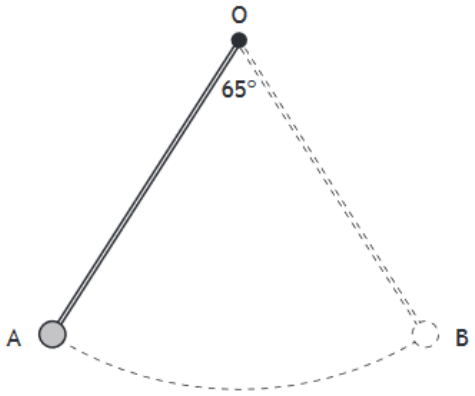
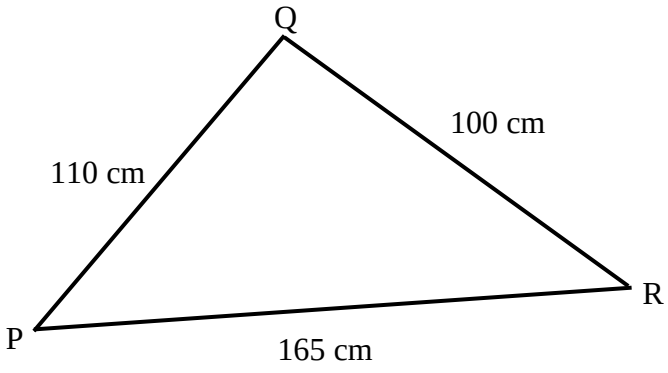
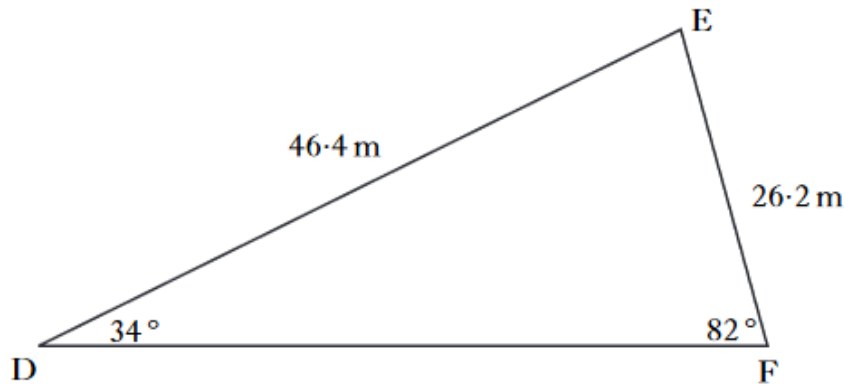
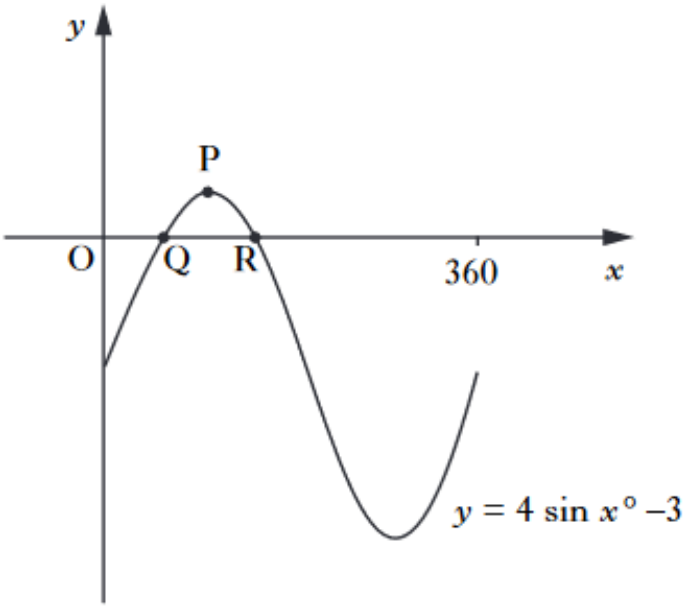
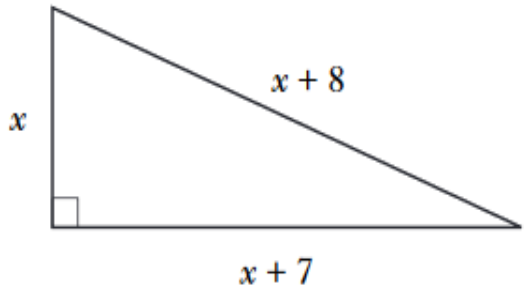
	Calculator Prelim Revision 2	**50**
1	In 2019 there were 1045 pupils on the school roll for Inverlady Higher School. It is forecast that the school roll will decrease by 4% per year. What will be the expected school role in 2023?	**3**
2	The pendulum of a clock swings along an arc of a circle, centre O  The pendulum swings through an angle of 65°. The length of the pendulum OA is 15 cm Calculate the length of arc AB.	**2**
3	A function is defined as $f(x) = \frac{1}{3}x + 9$ Given that $f(b) = 34$, calculate b	**2**
4	 For the triangle shown. Calculate the size of angle Q	**3**
5	Find the resultant vector $3\boldsymbol{v} - \boldsymbol{u}$ when $\boldsymbol{u} = \begin{pmatrix} -2 \\ 3 \\ 5 \end{pmatrix}$ and $\boldsymbol{v} = \begin{pmatrix} 0 \\ -4 \\ 7 \end{pmatrix}$. Give your answer in component form.	**2**

6	A straight line passes through the points (-3, -3) and (0,1). Calculate the equation of this straight line. Give your answer in the simplest form	**2**
7	As part of their training, footballers must run around a triangular circuit DEF.  How many **complete** circuits must they run in order to cover **at least** 1000 metres?	**4**
8	Three groups are booking a summer holiday. The first group consists of 4 adults and 3 children. The total cost of their holiday is £3874. (a) Write down an equation in x and y which satisfies the above information. The second group books the same holiday for 5 adults and 4 children. The total cost of their holiday is £4899. (b) Write down a second equation in x and y which satisfies this above information. (c) A third group books the same holiday for 2 adults and 1 child. The travel agent calculates that the total cost of their holiday is £1827. Has this group been overcharged? Justify your answer.	**1** **1** **4**
9	Solve the quadratic equation $4x^2 - 7x - 5 = 0$ Give your answers **correct to 1 decimal place**.	**4**

10	Venus and Earth are two planets within our solar system. The volume of Venus is approximately $9.38 \times 10^{11}\ km^3$. This is 86% of the volume of the Earth. Calculate the volume of the Earth. Give your answer in scientific notation rounded to **2 significant figures**	**4**
11	A straight line has an equation in the form $2x + 5y = 20$ State (i) The gradient of this straight line (ii) The coordinates of the x-intercept	**2** **1**
12	Part of the graph of $y = 4\sin x - 3$ is shown below  The graph cuts the x-axis at points Q and R. P is the maximum turning point. (a) Write down the coordinates of P (b) Calculate the x −coordinates of Q and R	 **2** **4**

13	A right angled triangle has dimensions as shown  Calculate the value of x	**5**
14	A coffeeshops sells take-away hot drinks in two different cup sizes.  The smaller cup has a height of $13\ cm$ and contains $400\ ml$ of coffee. The larger cup has a height of $15\ cm$ and contains $600\ ml$ of coffee. Are these two cups mathematically similar ?	**4**