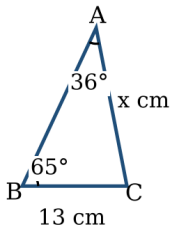
Day 322	S Tier 10-a-day

1 The diagram shows triangle ABC. (Calculator)
Work out the length of AC. Give your answer correct to 1 decimal place.
The diagram is not drawn accurately.



2 Solve $2^{4x+2} = 8^{x-3}$

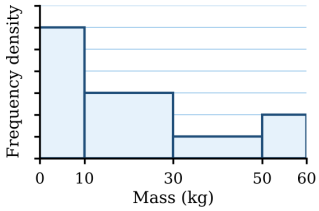
3 A metal pipe is a hollow cylinder with outer radius 5 cm and inner radius 4 cm. (Calculator)
The density of the metal is 2.7 g/cm^3.
The mass of the pipe is 1.53 kg.
Work out the length of the pipe. Give your answer in centimetres correct to 3 significant figures.

4 The price of a phone is increased by 50%.
The new price is then decreased by 5%.
Work out the overall percentage change in the price.

5 Solve $x^2 \geq 6x - 8$

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6 The histogram shows the masses of parcels delivered by a courier.
20 of them had a mass between 30 and 50 kg.
(a) How many had a mass between 0 and 10 kg?
(b) How many parcels are there in total?



7 (a) Show that the equation $x^2 - x - 5 = 0$ can be rearranged to give $x = 1 + \frac{5}{x}$ (Calculator)

(b) Use the iteration formula $x_{n+1} = 1 + \frac{5}{x_n}$ with $x_0 = 2$ to work out x_1 and x_2. Give each answer correct to 3 decimal places.

8 The population of a town is increased by 30%.
The new amount is then decreased by 5%.
Work out the overall percentage change.

9 ABCD is a rectangle with AB = 2 cm and AD = 4 cm.
A point P inside the rectangle is such that AP ≤ 2 cm and P is nearer to A than to B.
Work out the area of the region in which P can lie. Give your answer in terms of π and surds.

10 Simplify $\frac{1}{2+\sqrt{3}} + \frac{1}{2-\sqrt{3}}$
Give your answer with a rational denominator.