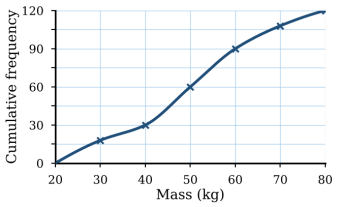
Day 157	IGCSE 10-a-day
1 In one country, income tax is worked out like this: The first £12,000 of income is not taxed. The next £30,000 is taxed at 20%. All income above that is taxed at 40%. Omar earns £47,000 in a year. Work out how much income tax Omar pays.	
2 Solve $3x^2 > 243$	
3 An open tray has a square base of side x cm and height h cm. The total outside surface area is 192 cm^2. (a) Show that the volume of the box is $V = \frac{1}{4}(192x - x^3)$ cm^3. (b) Find the maximum volume of the box, proving that it is a maximum.	
4 The number x is 850 correct to the nearest 50. Write down the error interval for x.	
5 A sector of a circle has radius 5 cm. The length of the arc of the sector is $\frac{25}{6}\pi$ cm. (a) Work out the angle of the sector. (b) Work out the area of the sector. Give your answer to (b) in terms of π.	

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6 The cumulative frequency graph shows the masses, in kg, of 120 parcels.
(a) Find the median. (b) Find the interquartile range.
(c) How many parcels have a mass greater than 60?



7 A and B are the points $(-4, -2)$ and $(-2, 10)$.
AB is a diameter of a circle.
Find an equation of the circle.

8 A curve has equation $y = x^3 + 9x - 5$.
(a) Show that the curve has no stationary points.
(b) Find the least value of the gradient of the curve.

9 The table gives information about the times taken by some people to travel to work.
An estimate for the mean is 30.2.
Work out the value of x.

Time, t (minutes)	Frequency
$10 < t \leq 20$	19
$20 < t \leq 30$	7
$30 < t \leq 40$	10
$40 < t \leq 50$	x
$50 < t \leq 60$	7

10 A particle moves in a straight line. After t seconds, its displacement from a fixed point O is s metres, where
$s = -t^3 + 6t^2 + t$ for $t \geq 0$
Find the greatest speed of the particle, and the value of t at which it occurs.