Day 47	IGCSE 10-a-day
1 A flight leaves London at 18:40 (London time). It takes 13 hours 30 minutes. When it is 12:00 in London it is 17:00 in Delhi. At what time, in Delhi time, does the flight land? Say if it is on a different day.	
2 $y = -3x^3 + 7x + 6$ Find $\frac{dy}{dx}$	
3 Sparkle Cleaners has a call-out fee of 50p plus £3.50 per hour. Fresh Start has a call-out fee of £7.50 plus £3 per hour. (a) Work out the number of hours for which the two costs are the same. (b) Which is cheaper for 18 hours, and by how much?	
4 A is the point $(-3, -2)$ and B is the point $(-5, -8)$. Find an equation of the perpendicular bisector of AB. Give your answer in the form $ax + by = c$, where a, b and c are integers.	
5 The curve $y = 2x^3 + 9x^2 + 18x$ has gradient 6 at two points. Find the x coordinates of these points.	

Day 47 **IGCSE 10-a-day**

6 $A = \begin{pmatrix} 2 & k \\ -1 & 2 \end{pmatrix}$ and $A^2 = \begin{pmatrix} 3 & 4 \\ -4 & 3 \end{pmatrix}$.
Find the value of k.

7 Write $\frac{1+\sqrt{7}}{3-\sqrt{7}}$ in the form $p + q\sqrt{7}$
where p and q are rational numbers.

8 A curve has equation $y = 5x + \frac{10}{\sqrt{x}}$ for $x > 0$.
Find the coordinates of the stationary point and determine its nature.

9 Tin A holds red paint and white paint in the ratio 6 : 6.
Tin B holds red paint and white paint in the ratio 4 : 1.
36 litres from tin A is mixed with some of tin B.
The ratio of red paint to white paint in the mixture is 7 : 4.
Work out how many litres were taken from tin B.

10 A ship sails 6 km from P to Q on a bearing of 042°.
It then sails 10 km from Q to R on a bearing of 163°.
(a) Work out PR (3 s.f.). (b) Work out the bearing of R from P (nearest degree).
(Calculator)

