Day 74 **IGCSE 10-a-day**

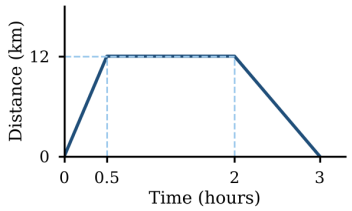
1 A flight leaves London at 06:05 (London time). It takes 8 hours 30 minutes.
When it is 12:00 in London it is 21:00 in Sydney.
At what time, in Sydney time, does the flight land? Say if it is on a different day.

2 A particle moves in a straight line. After t seconds its displacement from O is s metres, where

$s = 24t^{\frac{3}{2}} + t^2$ $(t \geq 0)$

Find the velocity and the acceleration of the particle when t = 9.

3 The graph shows Priya's cycle ride to a café and back.
(a) Work out Priya's speed on the way back.
(b) Work out Priya's average speed for the whole ride, including the stop.



4 The table shows the masses of 63 parcels.
(a) Write down the modal class.
(b) Work out an estimate for the mean. Give your answer to 1 decimal place. (Calculator)

Mass (kg)	Frequency
$20 < x \leq 30$	19
$30 < x \leq 40$	4
$40 < x \leq 50$	19
$50 < x \leq 60$	21

5 A curve has equation $y = 2x^3 + 3x^2 + 3x - 2$.
Show that y is an increasing function for all values of x.

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6 A point A is on level ground in line with the base of a mast. (Calculator) The angle of elevation of the top of the mast from A is 35°. B is a point on the same line, 50 m further from the mast than A. The angle of elevation of the top of the mast from B is 21°. Work out the height of the mast. Give your answer to 1 decimal place.	
7 An open container has a square base of side x cm and height h cm. The total outside surface area is 12 cm^2. (a) Show that the volume of the box is V = $\frac{1}{4}(12x - x^3)$ cm^3. (b) Find the maximum volume of the box, proving that it is a maximum.	
8 A rectangle has area 62 cm^2, correct to 2 significant figures. Its length is 9.800000000000000710542735760100185871124267578125 cm, correct to 2 significant figures. Work out the upper bound of the width of the rectangle. Give your answer correct to 3 significant figures. (Calculator)	
9 ABCD is a rectangle with AB = 2 cm and AD = 7 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 The line $y = -2x + k$ is a tangent to the curve $y = 3x^2 - 3x + 2$. Find the value of k.	