Day 354 **IGCSE 10-a-day**

1 $A = \begin{pmatrix} 2 & -4 \\ -4 & 1 \end{pmatrix}$ and $B = \begin{pmatrix} 1 & -2 \\ -4 & 0 \end{pmatrix}$.

(a) Work out AB.

(b) Work out BA.

2 A flight leaves London at 20:20 (London time).
It takes 8 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.

3 A particle moves in a straight line. Its displacement from O after t seconds is s metres, where

$s = -t^2 - 6t + 7$

(a) Work out the average velocity of the particle between t = 3 and t = 9.

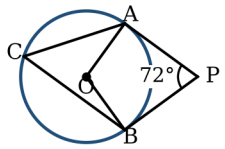
(b) Find the time at which the velocity equals this average velocity.

4 PA and PB are tangents to a circle, centre O. C is a point on the circle. Angle APB = 72°.

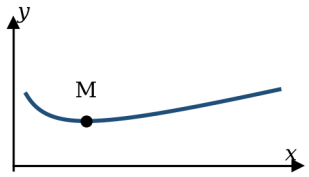
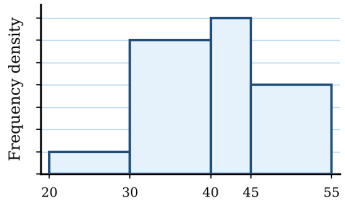
(a) Work out the size of angle AOB.

(b) Work out the size of angle ACB.

The diagram is not drawn accurately.



5 Solve $2x^2 + 14x > 0$

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6 The diagram shows a sketch of the curve $y = 3x + \frac{27}{x}$ for $x > 0$. The curve has a minimum point at M. Find the coordinates of M, justifying that it is a minimum. 	
7 The histogram shows the masses, in kg, of some parcels. The bar for 45 to 55 represents 16 parcels. (a) Work out the frequency of the class 30 to 40. (b) Work out the total frequency. 	
8 Kira sets off at 9:00 and cycles at 12 km/h along a path. Callum sets off from the same place at 9:15 and cycles at 16 km/h along the same path. At what time does Callum catch up with Kira?	
9 Two cones, P and Q, are mathematically similar. The volume of P is 108 cm^3 and the volume of Q is 32 cm^3. The curved surface area of P is 81 cm^2. Work out the curved surface area of Q.	
10 A curve has equation $y = 2x^3 + 12x^2 + 25x + 3$. Find the minimum value of the gradient of the curve, and the value of x at which it occurs.	