Day 112	A Level Maths: C Tier 10-a-day
1 A sector of a circle has radius 8 cm and angle 1.6 radians. Find (a) the arc length, (b) the perimeter of the sector.	
2 A circle has equation $(x - 3)^2 + (y - 2)^2 = 18$. Write down the centre and the radius of the circle.	
3 A bag has 3 red and 3 blue sweets. Two are taken at random without replacement. Find the probability that at least one of them is red.	
4 Find the sum of the first 10 terms of the series $-4 - 2 + 0 + 2 + ...$	
5 Two forces $(5\mathbf{i} + 2\mathbf{j})$ N and $(-13\mathbf{i} + 10\mathbf{j})$ N act on a particle of mass 4 kg. No other horizontal forces act. Find the acceleration of the particle as a vector in terms of $\mathbf{i}$ and $\mathbf{j}$.	

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6 X has probability density function $f(x) = \frac{3}{64}x^2$ for $0 \leq x \leq 4$, and 0 otherwise. Find E(X).	
7 Find the exact value of $\int_0^{\frac{\pi}{3}} 6 \sin 3x \, dx$.	
8 A boat moves with constant velocity $(-4\mathbf{i} + 3\mathbf{j})$ m s^{-1}. At time t = 0 its position vector is $(4\mathbf{i} - 2\mathbf{j})$ m. (a) Find its position vector when t = 3. (b) Find the distance it travels in 3 s.	
9 Solve $\sin x = \frac{1}{2}$ for $0° \leq x \leq 360°$.	
10 A is $(-1, -2)$ and B is (1, 0). AB is a diameter of a circle. Find the equation of the circle.	