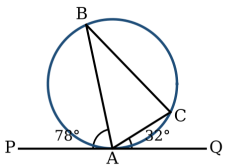
Day 83	S Tier 10-a-day
1 A circle has equation $x^2 + y^2 = 65$. The point P(−7, 4) lies on the circle. Find an equation of the tangent to the circle at P. Give your answer in the form ax + by = c, where a, b and c are integers.	
2 ABC is an isosceles triangle with AB = AC. Angle BAC = (4x − 20)° Angle ABC = (2x + 24)° (a) Work out the value of x. (b) Work out the size of angle BAC.	
3 A flight leaves London at 18:40 (London time). It takes 12 hours 45 minutes. When it is 12:00 in London it is 20:00 in Tokyo. At what time, in Tokyo time, does the flight land? Say if it is on a different day.	
4 An alloy is made by mixing 20 cm^3 of iron with 30 cm^3 of aluminium. The density of iron is 7.9 g/cm^3. The density of aluminium is 2.7 g/cm^3. Work out the density of the alloy.	
5 PAQ is a tangent to the circle at A. B and C are points on the circle. Angle PAB = 78° and angle CAQ = 32°. (a) Work out the size of angle ABC. (b) Work out the size of angle ACB. The diagram is not drawn accurately. 	

Day 83	S Tier 10-a-day
6 $f(x) = \frac{4}{x-5} + 2$ (a) Find $f^{-1}(x)$. (b) Find the value of $f^{-1}(0)$.	
7 Jess invests £1,000. The account pays compound interest of 6% a year for the first 2 years, then 3.5% a year for the next 2 years. Work out the total amount after 4 years, to the nearest penny. (Calculator)	
8 A culture has 800 bacteria. The number of bacteria increases by 6% each hour. After how many whole hours will there first be more than 2000 bacteria? (Calculator)	
9 A bag contains some sweets. 3 of them are red and the rest are yellow. Two sweets are taken at random without replacement. The probability that both are red is $\frac{3}{55}$. Work out how many sweets are yellow.	
10 A point A is on level ground in line with the base of a cliff. (Calculator) The angle of elevation of the top of the cliff from A is 31°. B is a point on the same line, 30 m further from the cliff than A. The angle of elevation of the top of the cliff from B is 23°. Work out the height of the cliff. Give your answer to 1 decimal place.	