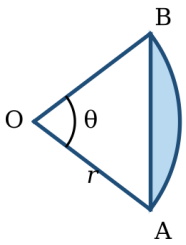
Day 358	A Level Maths: B Tier 10-a-day

1 The shaded region is the segment cut off by the chord AB of a circle with centre O and radius 9 cm. Angle AOB = 1.8 radians.
Find the area of the segment, to 3 s.f.



2 Find the set of values of x for which
$4x - 5 \leq 6$ and $x^2 - 9x + 14 > 0$.

3 80 students: 35 play football, 21 play tennis, 39 do neither.
(a) How many do both?
(b) Given a person who plays football, find P(this person plays tennis).

4 A particle of mass 3 kg is acted on by forces $(2\mathbf{i} + 8\mathbf{j})$ N and $\mathbf{P}$ N only. Its acceleration is $(-\mathbf{i} + 4\mathbf{j})$ m s^{-2}.
Find $\mathbf{P}$, and its magnitude to 3 significant figures.

5 X ~ B(9, 0.2) and Y ~ B(10, 0.6) are independent.
Find P(X = 1 and Y ≤ 7), to 3 significant figures.

Day 358	A Level Maths: B Tier 10-a-day
6 Find the exact value of $\int_0^3 \frac{3}{2x+1}\,dx$, giving your answer in the form a ln b.	
7 Prove that $x^2 - 6x + 17 > 0$ for all real values of x.	
8 Line l_1: $\mathbf{r} = \begin{pmatrix} 3 \\ 8 \\ -3 \end{pmatrix} + \lambda \begin{pmatrix} 3 \\ 3 \\ 0 \end{pmatrix}$. Line l_2: $\mathbf{r} = \begin{pmatrix} 0 \\ 2 \\ -3 \end{pmatrix} + \mu \begin{pmatrix} 3 \\ 0 \\ 0 \end{pmatrix}$. Show that l_1 and l_2 intersect and find the point.	
9 Given that $\sqrt{5}$ is irrational, prove by contradiction that $7 + 3\sqrt{5}$ is irrational.	
10 A stone is thrown vertically upwards at 4.9 m s^{-1} from a point 9.8 m above horizontal ground. Take g = 9.8 m s^{-2}. Find the time before it hits the ground.	