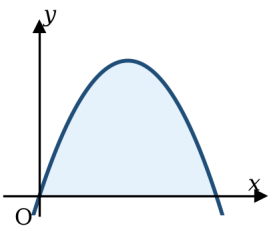
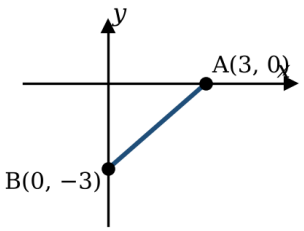
Day 343	A Level Maths: C Tier 10-a-day
1 Simplify $(4x^2)^2 \div 2x^{-1}$.	
2 A drone moves with constant velocity $(-5\mathbf{i} - 12\mathbf{j})$ m s^{-1}. At time t = 0 its position vector is $(5\mathbf{i} + 8\mathbf{j})$ m. (a) Find its position vector when t = 3. (b) Find the distance it travels in 3 s.	
3 The vector $\mathbf{p} = 5\mathbf{i} - 12\mathbf{j}$. Find (a) $\lvert\mathbf{p}\rvert$, (b) the angle p makes with the positive x-axis, measured anticlockwise (1 d.p.).	
4 $X \sim N(150, 8^2)$. Given that $P(X < a) = 0.7$, find a to 3 s.f.	
5 The diagram shows the curve $y = 3x(4 - x)$. Find the area of the shaded region, between the curve and the x-axis. 	

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6 The diagram shows a line meeting the axes at A and B.
Find (a) the equation of AB in the form px + qy = r with integers p, q and r, (b) the length AB.



7 Two forces $(-4\mathbf{i} - 2\mathbf{j})$ N and $(19\mathbf{i} + 7\mathbf{j})$ N act on a particle of mass 5 kg. No other horizontal forces act. Find the acceleration of the particle as a vector in terms of $\mathbf{i}$ and $\mathbf{j}$.

8 $\frac{-3x - 4}{(x + 1)(x + 2)} \equiv \frac{A}{x + 1} + \frac{B}{x + 2}$.
Find A and B, and hence find $\int \frac{-3x - 4}{(x + 1)(x + 2)}\, dx$.

9 The continuous random variable X has probability density function $f(x) = kx^3$ for $0 \leq x \leq 3$, and 0 otherwise.
Find the value of k.

10 The line $y = 3x + k$ is a tangent to the curve $y = x^2 + 7x + 4$.
Find the value of k.