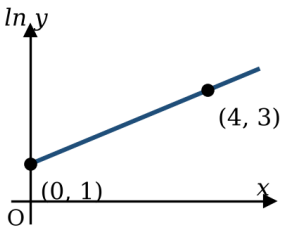
Day 21	A Level Maths: A Tier 10-a-day
1 10 values have $\Sigma x = 550$ and $\Sigma x^2 = 31060$. One value was recorded as 41 but should have been 48. Find the correct mean and standard deviation (3 s.f.).	
2 The points A, B and C have coordinates $(-2, 2, -3)$, $(-2, 1, 2)$ and $(-1, -2, -2)$. Find angle ABC, in degrees to 1 d.p.	
3 An arithmetic series has first term 7 and common difference 4. The sum of the first n terms is 525. Find n.	
4 A 12 kg box is pulled along rough horizontal ground, $\mu = \frac{1}{3}$, by a rope at angle θ above the horizontal, where $\tan\theta = \frac{5}{12}$. The tension is 40 N. Find (a) the normal reaction, (b) the acceleration of the box. Take g = 9.8. Give answers to 3 s.f. if not exact.	
5 X, the height (cm), is $N(179, 7^2)$. Find the symmetric limits about the mean between which the central 99% of values lie (3 s.f.).	

Day 21	A Level Maths: A Tier 10-a-day

6 A particle P moves on the x-axis with velocity v = $(6t^2 - 18t + 12)$ m s^{-1} at time t s, $t \geq 0$, and starts at O. Find (a) the times when P is at instantaneous rest, (b) the total distance P travels in the first 4 s.

7 A circle touches both coordinate axes and passes through the point $(3, -6)$. Its centre lies in the fourth quadrant.
Find the equations of the two possible circles.

8 The diagram shows the graph of ln y against x for $y = A e^{kx}$.
Find the exact values of A and k.



9 Use integration by parts twice to find the exact value of

$$\int_0^2 x^2 e^x \, dx.$$

10 The diagram shows a circle that touches the x-axis at A$(-3, 0)$ and passes through B$(1, 4)$.
Find the equation of the circle.

