Day 77	A Level Maths: A Tier 10-a-day
1 X, the mass (g), is normally distributed with mean 61 and standard deviation 5. Find (a) P(X > 64) (b) P(64 < X < 74), each to 3 s.f.	
2 $y = 5 \times 3^x$. The gradient of the curve at P is 135 ln 3. Find the x-coordinate of P.	
3 Given that $(x - 5)$ is a factor of $f(x) = x^3 - 3x^2 - 25x + 75$, solve $f(x) > 0$.	
4 A lift of mass 250 kg carries a person of mass 90 kg. The cable tension is 3604 N and the lift is accelerating. Find (a) the magnitude and direction of the acceleration, (b) the force of the floor on the person. Take g = 9.8.	
5 θ is small and measured in radians. Use small angle approximations to show that $2\sin 3\theta + \cos 3\theta = 1.5$ can be written as $a\theta^2 + b\theta + c = 0$ with integers a, b, c. Hence find the approximate solution with $0 < \theta < 0.8$, to 3 s.f.	

Day 77	A Level Maths: A Tier 10-a-day
6 A ball is projected from a point O on horizontal ground at 49 m s^{-1} at angle α above the horizontal, $\tan\alpha = \frac{3}{4}$, and lands at A. Find (a) the time of flight, (b) the greatest height, (c) OA. Take g = 9.8.	
7 30 values have $\Sigma x = 810$ and $\Sigma x^2 = 22620$. One value was recorded as 39 but should have been 24. Find the correct mean and standard deviation (3 s.f.).	
8 A circle touches both coordinate axes and passes through the point (2, 4). Its centre lies in the first quadrant. Find the equations of the two possible circles.	
9 Solve the differential equation $y\frac{dy}{dx} = e^x$, given that y = 2 when x = 0 (y > 0). Give y in terms of x.	
10 Solve $\lvert 2x - 7\rvert > \lvert -3x - 7\rvert$.	