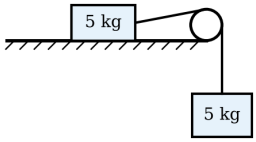
| Day 229 | A Level Maths: B Tier 10-a-day |
|---|---|
| **1** Solve $-5 < 5x - 3 < 9$. | |
| **2** A sector of a circle has area 19.8 $cm^2$ and angle 1.1 radians.<br>Find (a) the radius, (b) the perimeter of the sector. | |
| **3** A particle has velocity $(5\mathbf{i} + 6\mathbf{j})$ m $s^{-1}$ at time t = 0 and moves with constant acceleration $(3\mathbf{i} + 3\mathbf{j})$ m $s^{-2}$.<br>Find its velocity and speed when t = 5. | |
| **4** Find the exact value of<br>$\int_0^{\frac{\pi}{2}} (3\cos^2 x - 1)\,dx$. | |
| **5** A curve has parametric equations $x = 2t - 1$, $y = -t^2 + 4t - 3$.<br>The line $y = -x + 4$ meets the curve at two points.<br>Find the coordinates of these points. | |

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|---|---|
| **6** A block of mass 5 kg lies on a rough horizontal table (coefficient of friction 0.3). It is joined by a light string over a smooth pulley to a particle of mass 5 kg hanging freely.<br>Take $g = 9.8$ m s$^{-2}$.<br>The system is released. Find the acceleration and the tension in the string.<br> | |
| **7** Marks are normal: Biology N(60, $8^2$), Chemistry N(72, $9^2$).<br>Anna scores 64 in Biology and 90 in Chemistry.<br>Which is her better performance, relatively? | |
| **8** Prove, by exhaustion, that a cube number cannot be written in the form $7k + 5$, where k is an integer. | |
| **9** A bag has 4 white and 6 black sweets; two are taken without replacement.<br>(a) Find P(exactly one white).<br>(b) Find P(at least one white). | |
| **10** £1000 is invested at 5% compound interest per year.<br>Find the least whole number of years for the investment to exceed £5000. | |