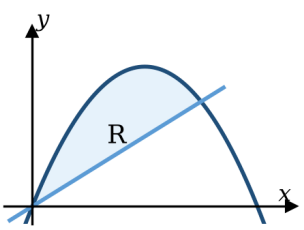
| Day 14 | A Level Maths: B Tier 10-a-day |
|---|---|
| **1** A boat moves in a straight line with constant acceleration. Its initial speed is 15 m $s^{-1}$, its final speed is 27 m $s^{-1}$ and it travels 84 m.<br>Find the time taken. | |
| **2** Each of 11 people independently supports a team with probability 0.6; X is the number of supporters.<br>This is done 100 times. Estimate the number of times that X = 6. | |
| **3** Two forces of magnitude 3 N and 4 N act at right angles on a particle.<br>Find the magnitude of the resultant, and the angle it makes with the 3 N force, to 1 d.p. | |
| **4** A sector of a circle has radius 12 cm and angle 300°.<br>Find, in terms of $\pi$, the arc length and the area of the sector. | |
| **5** $f(x) = -x + 5$ for $-4 \leq x < -2$.<br>Find the range of f. | |

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|---|---|
| **6** Solve $\frac{dy}{dx} = 2xy$, given that $y = 1$ when $x = 0$.<br>Give y in terms of x. | |
| **7** Prove, by exhaustion, that a square number cannot be written in the form $7k + 6$, where k is an integer. | |
| **8** The continuous random variable X has pdf f(x) $= \frac{2x}{4}$ for $0 \leq x \leq 2$, and 0 otherwise.<br>(a) Find $P(X > 1)$.<br>(b) Find the median of X, to 3 significant figures. | |
| **9** The line $y = 5x - 14$ meets the circle $x^2 + (y + 1)^2 = 65$ at the points A and B. Find the coordinates of A and B, and the exact length of the chord AB. | |
| **10** The diagram shows the curve $y = x(4 - x)$ and the line $y = x$.<br>Find the exact area of the shaded region R.<br> | |