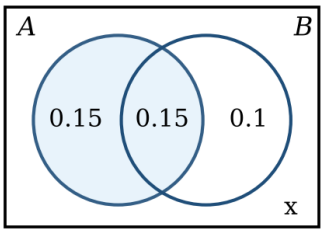
**Day 257** **A Level Maths: C Tier 10-a-day**

**1** (a) Convert $\frac{3\pi}{4}$ radians to degrees.

(b) Convert 15° to radians, giving your answer in terms of $\pi$.

**2** Evaluate $\sum_{r=1}^{7} (-2r - 4)$.

**3** The Venn diagram shows probabilities for events A and B.
Find the value of x.




**4** Three forces $(-6\mathbf{i} - 6\mathbf{j})$ N, $(p\mathbf{i} + q\mathbf{j})$ N and $(2\mathbf{i})$ N act on a particle which is in equilibrium. $\mathbf{i}$ and $\mathbf{j}$ are perpendicular unit vectors. Find the values of p and q.

**5** $f(x) = \ln x + x - 4$.
Use the Newton-Raphson method with $x_0 = 3$ to find $x_1$,
giving your answer to 3 decimal places.

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| **6** The circle $(x - 4)^2 + (y - 2)^2 = 5$ passes through P(3, 4).<br>Find the gradient of the tangent to the circle at P. | |
| **7** $f(x) = 4 \sin x + 3 \cos x + 6$.<br>Write f(x) in the form $R \sin(x + \alpha) + 6$, with $\alpha$ in degrees to 1 d.p., and state the maximum value of f(x). | |
| **8** A lift of mass 200 kg is raised by a vertical cable with constant acceleration 0.75 m $s^{-2}$ upwards. Take g = 9.8 m $s^{-2}$.<br>Find the tension in the cable. | |
| **9** X ~ B(60, 0.2). Use a normal approximation to find $P(X \geq 14)$, to 3 s.f. | |
| **10** $f(x) = \frac{6}{x - 2}$, $x \neq 2$.<br>Find $f^{-1}(x)$. | |