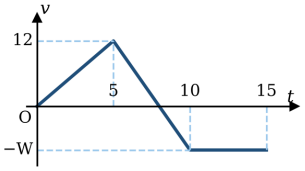
| Day 3 | A Level Maths: S Tier 10-a-day |
|---|---|

**1** Solve $\cos(2\theta + 40°) = \frac{\sqrt{2}}{2}$ for $-90° \leq \theta \leq 270°$.

**2** $f(x) = 2x - 4$ and $g(x) = x^2 - 4$.
Solve $fg(x) = gf(x)$.

**3** A data set has lower quartile 18 and upper quartile 29. An outlier is a value more than 1.5 × IQR beyond the nearest quartile.
(a) Find the range of values that are not outliers.
(b) 10 observations have mean 24. The largest is 47, an outlier, and it is removed. Find the new mean.

**4** The diagram shows the velocity-time graph of a particle P moving on a straight line (velocity in m $s^{-1}$, time in s). At time 15 s, P is back at its starting point.
Find (a) the value of W, (b) the greatest distance of P from its starting point.




**5** Find the exact value of $\sin(\sin^{-1}(\frac{7}{25}) + \cos^{-1}(\frac{5}{13}))$.

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|---|---|
| **6** For events A and B, P(A) = 0.8, P(B) = 0.15 and P(A \| B) = 0.25.<br>(a) Find P(A ∩ B).<br>(b) Find P(A \| B′). | |
| **7** Each year Jo pays £1000 into an account on 1 January.<br>Interest of 5% is added each 31 December.<br>Find the first year-end at which the balance exceeds £12,000. | |
| **8** Find the exact coordinates of the stationary point of<br>$y = \frac{\ln x}{x}$ for $x > 0$,<br>and determine its nature. | |
| **9** Express $\frac{3x^3 + 4x^2 - 36x - 33}{(x + 3)(x - 3)}$ in the form $ax + b + \frac{C}{(x + 3)} + \frac{D}{(x - 3)}$. | |
| **10** A particle P moves on a straight line. At time t = 0, P passes through the fixed point O with velocity $-80$ m s$^{-1}$. At time t seconds, P has acceleration $(-3t + 26)$ m s$^{-2}$.<br>Find (a) the times at which P is at O again, (b) the greatest distance of P from O before it first returns to O. | |