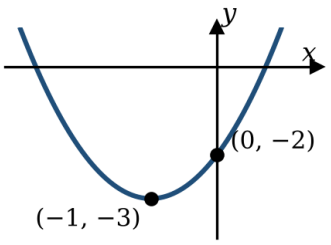
| Day 246 | A Level Maths: C Tier 10-a-day |
|---|---|
| **1** Write $2 \log a + 4 \log b - \log c$ as a single logarithm. | |
| **2** A circle has equation $(x - 3)^2 + (y + 3)^2 = 9$. Determine whether the point P(4, 4) is inside, outside or on the circle. | |
| **3** A population of 400 grows by 3% each year. After how many whole years will it first exceed 1200? | |
| **4** Find the remainder when $-2x^3 + 3x^2 - 2x + 6$ is divided by $(2x - 5)$. | |
| **5** The curve $y = ab^x$ passes through (0, 4) and (3, 256).<br>Find the values of a and b. | |

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**6** For data set A, r = 0.54. For data set B, r = −0.77.
Which data set has the stronger linear correlation? Give a reason.

**7** The diagram shows a sketch of a quadratic curve.
Find its equation in the form $y = a(x - p)^2 + q$.




**8** Two forces $(4\mathbf{i} - 4\mathbf{j})$ N and $(2\mathbf{i} + 6\mathbf{j})$ N act on a particle of mass 2 kg. No other horizontal forces act. Find the acceleration of the particle as a vector in terms of **i** and **j**.

**9** X ~ B(50, 0.6). Use a normal approximation to find P(X ≤ 33), to 3 s.f.

**10** A particle moving in a straight line with constant acceleration increases its speed from 1 m $s^{-1}$ to 15 m $s^{-1}$ in 12 s.
Find the distance it travels in this time.