| Day 247 | IGCSE 10-a-day |
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| **1** $y = x(x - 2)(2x - 2)$<br>Work out the gradient of the curve at the point where $x = -2$. | |
| **2** Write these numbers in order of size, starting with the largest.<br>$\frac{4}{7}$, 78%, 86%, $\frac{3}{4}$ | |
| **3** The ratio of boys to girls in a school is 2 : 3.<br>80% of the boys and 45% of the girls walk to school.<br>What percentage of all of these students walk to school? | |
| **4** Factorise fully $5x^3 - 245x$ | |
| **5** $y = (\sqrt{x} + 5)^2$<br>Find $\frac{dy}{dx}$. Give each term of your answer in the form $ax^n$. | |

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| **6** $\mathbf{a} = \begin{pmatrix}1\\1\end{pmatrix}$, $\mathbf{b} = \begin{pmatrix}1\\-4\end{pmatrix}$ and $\mathbf{c} = \begin{pmatrix}8\\-17\end{pmatrix}$.<br>$\mathbf{c} = m\mathbf{a} + n\mathbf{b}$.<br>Find the value of m and the value of n. | |
| **7** A curve has equation $y = x^3 - 2x + 3$.<br>Find the equations of the two tangents to the curve that are parallel to the line $y = x - 2$. | |
| **8** A = (3, 2), B = (6, 3) and C = (2, 5).<br>Show that triangle ABC is isosceles and right-angled. | |
| **9** P is directly proportional to v and inversely proportional to the square of t.<br>When v = 6 and t = 2, P = 36.<br>Work out the value of P when v = 3 and t = 6. | |
| **10** The graph of y = f(x) has a minimum point at (−4, 0).<br>Write down the coordinates of the turning point of the graph of<br>(a) y = f(x/2)<br>(b) y = f(x + 4) + 2 | |