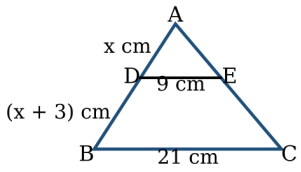
**Day 130** **IGCSE 10-a-day**

**1** Write $\frac{3}{3+\sqrt{5}}$ in the form $\frac{p+q\sqrt{5}}{r}$
where p, q and r are integers and r > 1,
and the fraction is in its simplest form.

**2** n is an integer.
Work out the sum of all the values of n that satisfy
$-2 < -n - 1 \leq 5$

**3** In the diagram, DE is parallel to BC.
AD = x cm, DB = (x + 3) cm, DE = 9 cm and BC = 21 cm.
(a) Find the value of x.
(b) Work out the length of AB.
The diagram is not drawn accurately.




**4** The function $f(x) = -x^2 + 8x - 3$ is decreasing when x > k.
Find the value of k.

**5** The table shows information about 110 students.
(a) A student who studies French is chosen at random. Work out the probability that this student is a boy.
(b) Two of the 110 students are chosen at random. Work out the probability that both are boys.

| | French | Spanish | German |
|---|---|---|---|
| Boys | 25 | 12 | 15 |
| Girls | 29 | 13 | 16 |

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| **6** Solve $x^4 - 61x^2 + 900 = 0$ | |
| **7** $y = -2x^3 - 9x^2 - 6$<br>(a) Show that there is a stationary point at $x = 0$.<br>(b) By finding the gradient when $x = -\frac{1}{2}$ and when $x = \frac{1}{2}$, decide whether it is a maximum or a minimum. | |
| **8** The graph of $y = f(x)$ has a maximum point at $(-4, -2)$.<br>Write down the coordinates of the turning point of the graph of<br>(a) $y = f(x + 1)$<br>(b) $y = 3f(x + 2)$ | |
| **9** The tangent to the curve $y = x^3 - 2x^2 + 3x - 2$ at the point P where $x = 2$ meets the curve again at Q.<br>Find the coordinates of Q. | |
| **10** A bakery makes x cakes and y loaves in a morning.<br>Each cake needs 6 minutes of oven time and 2 kg of flour. Each loaf needs 2 minutes of oven time and 2 kg of flour.<br>There are 72 minutes of oven time and 32 kg of flour available.<br>The profit is £8 for each cake and £7 for each loaf.<br>(a) Write down two inequalities, other than $x \geq 0$, $y \geq 0$. (b) Find the greatest profit. | |