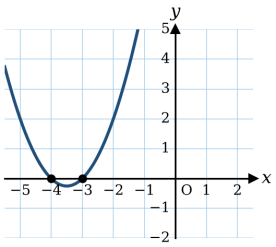
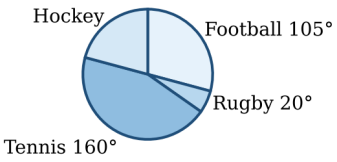
**Day 172** **A Tier 10-a-day**

**1** The diagram shows the graph of $y = x^2 + bx + c$.
Find the value of b and the value of c.



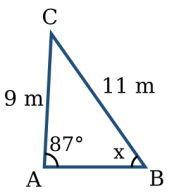

**2** $\mathbf{v} = \begin{pmatrix} 8 \\ 15 \end{pmatrix}$.
Work out the magnitude (length) of $\mathbf{v}$.

**3** The pie chart shows how some students chose a sport.
4 students chose rugby.
(a) Work out the angle for hockey.
(b) How many students chose hockey?




**4** Tom sells a guitar for £224 and makes a profit of 12%.
Work out how much Tom paid for the guitar.

**5** A tank is in the shape of a cuboid measuring 60 cm by 80 cm by 150 cm.
It already contains 20 litres of water.
Water flows in at 8 litres per minute until the tank is full.
Work out how long this takes. Give your answer in minutes.

| Day 172 | A Tier 10-a-day |
|---|---|
| **6** y is directly proportional to the cube of x.<br>When x = 3, y = 243.<br>(a) Find a formula for y in terms of x.<br>(b) Work out the value of y when x = 6. | |
| **7** A cafe menu has 5 starters, 6 main courses and 3 desserts.<br>(a) How many different three-course meals are possible?<br>(b) A customer chooses a main course and either a starter or a dessert (not both). How many different meals are possible? | |
| **8** The length and width of a rectangular garden are 18.0 m and 10.9 m.<br>Each measurement is correct to 1 decimal place.<br>Work out the upper bound for the area. | |
| **9** Ella invests £1,500 in a savings account. (Calculator)<br>Compound interest is paid at a fixed rate each year.<br>After 2 years the investment is worth £1,749.60.<br>Work out the annual rate of interest. | |
| **10** Work out the size of angle x. (Calculator)<br>Give your answer to 1 decimal place.<br>The diagram is not drawn accurately.<br> | |