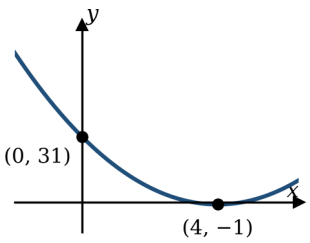
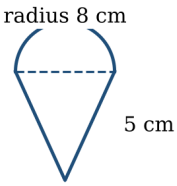
Day 303	S Tier 10-a-day
1 A circle has centre C(1, 1) and passes through the point P(−2, 6). Find an equation of the circle.	
2 The mean of 11 numbers is 78. One number is removed and the mean of the remaining 10 numbers is 81.2. Work out the number that was removed.	
3 Write $\frac{10}{2+\sqrt{2}}$ in the form $p + q\sqrt{2}$ where p and q are integers.	
4 A stone block in the shape of a cuboid weighs 630 N. Its smallest face has area 800 cm^2. Its largest face has area 1,500 cm^2. Pressure = force ÷ area Work out (a) the greatest pressure and (b) the least pressure the stone block can exert on the ground, in N/m^2.	
5 Given that $\frac{27^5 \times 27^2}{9} = 3^n$, find the value of n.	

Day 303 **S Tier 10-a-day**

6 The diagram shows a sketch of a quadratic curve with a turning point at (4, −1).
The curve crosses the y-axis at (0, 31).
Find an equation of the curve.
Give your answer in the form $y = ax^2 + bx + c$.



7 A solid is made from a cone of height 5 cm and a hemisphere. Both have radius 8 cm.
Work out the total volume of the solid. Give your answer in terms of π.



8 A circle has equation $x^2 + y^2 = 25$.
The point P(4, 3) lies on the circle.
(a) Find the equation of the tangent to the circle at P. Give your answer in the form ax + by = c, where a, b and c are integers.
(b) The tangent meets the x-axis at the point T.
Write down the coordinates of T.

9 Given that $(a + \sqrt{6})^2 = 10 + 4\sqrt{6}$,
where a is a positive integer, find the value of a.

10 A boat leaves a harbour P and travels 37 km on a bearing of 050° to Q. (Calculator)
It then travels 112 km on a bearing of 095° to R.
(a) Work out the distance PR.
(b) Work out the bearing of R from P.
Give distances to 1 decimal place and the bearing to the nearest degree.