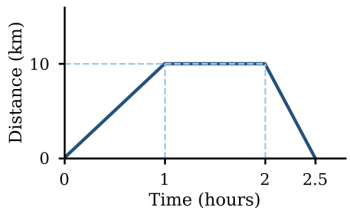
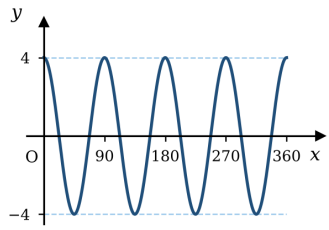
Day 162 **S Tier 10-a-day**

1 Expand and simplify $(x - 1)^2(x - 3)$

2 The graph shows Kira's cycle ride to a café and back.
(a) Work out Kira's speed on the way back.
(b) Work out Kira's average speed for the whole ride, including the stop.



3 The diagram shows the graph of $y = a \cos bx$, where a and b are positive integers.
(a) Write down the value of a and the value of b.
(b) Work out the value of y when $x = 120°$.



4 Write $\sqrt{175} - \sqrt{112} + \sqrt{7}$ in the form $a\sqrt{7}$ where a is an integer.

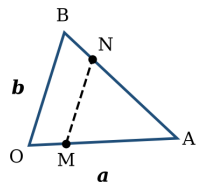
5 Simplify fully $\dfrac{x^2 - 2x - 24}{x^2 - 13x + 42}$

Day 162 **S Tier 10-a-day**

6 A barrel is $\frac{3}{4}$ full.
33 more litres of oil are added and the barrel is then $\frac{9}{10}$ full.
Work out the capacity of the barrel.

7 P is inversely proportional to the square root of t.
When t = 4, P = 3.
Find the positive value of t when P = 6.

8 OAB is a triangle. OA = **a** and OB = **b**.
M is on OA with OM : MA = 1 : 3. N is on AB with AN : NB = 3 : 1.
(a) Find ON in terms of **a** and **b**.
(b) Show that MN is parallel to OB.
The diagram is not drawn accurately.



9 The 5-digit number 2230k is a multiple of 6.
k is a single digit.
Find all the possible values of k.

10 Dina and Nadia share some money in the ratio 4 : 5.
Dina gives Nadia £26.
The ratio of their money is now 2 : 7.
How much money do they have altogether?