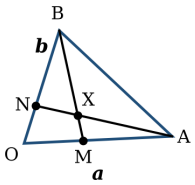
Day 193 **S Tier 10-a-day**

1 OAB is a triangle. OA = **a** and OB = **b**.
M is on OA with OM : MA = 2 : 3. N is on OB with ON : NB = 1 : 2. AN and BM intersect at X.
(a) Find BM in terms of **a** and **b**.
(b) Find OX in terms of **a** and **b**.
The diagram is not drawn accurately.

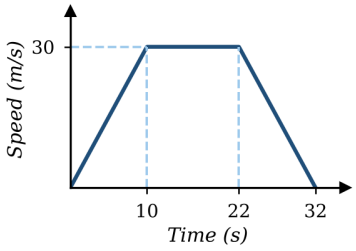


2 Factorise fully $5x^2 + 5x - 210$

3 Write $\sqrt{180} - \sqrt{125} + \sqrt{5} + \sqrt{80}$ in the form $a\sqrt{5}$ where a is an integer.

4 Kira changes £400 into dollars at £1 = $1.15.
Kira spends $120 and then changes the rest back into pounds at £1 = $1.25.
How many pounds does Kira get back?

5 The graph shows the speed of a train between two stations.
(a) Work out the acceleration in the first 10 seconds.
(b) Work out the total distance.



Day 193	S Tier 10-a-day
6 A solid cylinder of radius 10 cm and height 8 cm is melted down. The metal is used to make identical solid spheres of radius 2 cm. Work out the number of spheres that can be made. The volume of a sphere of radius r is $\frac{4}{3}\pi r^3$.	
7 A van is worth £2,000 when new. Its value decreases by 8% each year. After how many whole years will it first be worth less than £1,350? (Calculator)	
8 The side length of a square is decreased by 10%. Work out the percentage change in the area of the square.	
9 A circle has equation $x^2 + y^2 = 625$. The point P(24, 7) 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.	
10 A factory makes 20,000 parts. 8% of them are faulty. A scanner flags 75% of faulty parts and wrongly flags 5% of parts that are not faulty. A part is chosen at random from the parts flagged by the scanner. Work out the probability that this part is faulty.	