Day 118	S Tier 10-a-day
1 Solve $\frac{x + 7}{2} + \frac{x + 1}{6} = 7$	
2 The mean of 6 numbers is 60.5. One number is removed and the mean of the remaining 5 numbers is 67.4. Work out the number that was removed.	
3 The 4-digit number 660k is a multiple of 9. k is a single digit. Find all the possible values of k.	
4 x : y = 4 : 5 Work out the ratio (4x − 2y) : (6x + 1y) Give your answer in its simplest form.	
5 The value of a house is decreased by 8% in one year. The next year its value is decreased by 10%. It is now worth £372,600. Work out the value of the house before the first change.	

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6 A car loses 20% of its value each year. After 3 years it is worth £3,072. Work out its value when it was new. (Calculator)	
7 Write $\frac{2}{x-6} + \frac{6}{x+3}$ as a single fraction. Simplify the numerator.	
8 OA = **a** and OB = **b**. OP = 4**a** + 3**b**, OQ = 6**a** and OR = 10**a** − 6**b**. (a) Show that P, Q and R lie on a straight line. (b) Work out the ratio PQ : QR in its simplest form.	
9 Show that the line $y = -3x - 10$ is a tangent to the circle $x^2 + y^2 = 10$. Find the coordinates of the point where the line touches the circle.	
10 OAB is a triangle. OA = **a** and OB = **b**. M is on OA with OM : MA = 1 : 4. N is on OB with ON : NB = 3 : 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. 	