Day 252	A Tier 10-a-day
1 Isla earns £20000 a year. She pays no tax on the first £12000. She pays 25% tax on the rest. Work out how much tax she pays in a year.	
2 Expand and simplify $(3x + 3)(2x - 4)$	
3 A closed block is a cuboid measuring 12 cm by 11 cm by 2 cm. Work out the total surface area.	
4 A school has 40 students in Year 9, 50 in Year 10 and 40 in Year 11. A stratified sample of 13 students is to be taken. Work out how many students should be chosen from Year 10.	
5 $x_{n+1} = 5 + \frac{5}{x_n}$ $x_0 = 2$ Work out the values of x_1, x_2 and x_3. Give your answers correct to 3 decimal places. (Calculator)	

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6 Work out $(3\frac{2}{5} - 2\frac{1}{2}) \times 2\frac{1}{2}$ Give your answer as a mixed number in its simplest form.	
7 A boat leaves a port and travels 24 miles on a bearing of 100°. (Calculator) It then travels 18 miles on a bearing of 010°. (a) Work out how far it is now from the port. (b) Work out the bearing of its final position from the port. Give your answer to the nearest degree.	
8 Here are the first five terms of a quadratic sequence. −5, 1, 13, 31, 55 (a) Find an expression for the nth term. (b) Work out the 12th term.	
9 Zara invests £6,500 in a savings account. (Calculator) Compound interest is paid at a fixed rate each year. After 2 years the investment is worth £6,762.60. Work out the annual rate of interest.	
10 Boat P sails 13 miles from a harbour on a bearing of 115°. Boat Q sails 6 miles from the same harbour on a bearing of 160°. (Calculator) Work out the distance between the two boats. Give your answer to 3 significant figures.	