Day 194 **S Tier 10-a-day**

1 (a) Solve $2 - 3x < 20$
(b) n is an integer. Write down all the values of n that satisfy
$-14 \leq 4n - 2 \leq 6$

2 Evan invests £7,000 at 3% per year compound interest.
After how many whole years will the investment first be worth more than £10,500?
(Calculator)

3 Zip Taxis has a fixed charge of £4 plus £3 per mile.
Go Cabs has a fixed charge of £22 plus £1.50 per mile.
(a) Work out the number of miles for which the two costs are the same.
(b) Which is cheaper for 15 miles, and by how much?

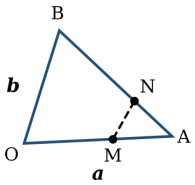
4 The table shows information about 108 students.
(a) A student who studies French is chosen at random. Work out the probability that this student is a boy.
(b) Two of the 108 students are chosen at random. Work out the probability that both are boys.

	French	Spanish	German
Boys	5	30	16
Girls	16	29	12

5 A shop buys a guitar for £70.
It adds an 80% mark-up to get the selling price.
In a sale the selling price is reduced by 20%.
Work out the percentage profit or loss on the original cost.

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



7 A square has sides of length $(4 + \sqrt{6})$ cm.
Work out the area of the square.
Give your answer in the form $a + b\sqrt{6}$

8 A and B are points on the curve $y = 3x^2 + 3x + 4$.
The x coordinate of A is -1 and the x coordinate of B is 0.
Work out the gradient of the line AB.

9 Show that $\sqrt{28 + 6\sqrt{3}} = 1 + 3\sqrt{3}$

10 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 = 3 : 1. 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.

