

1. The book was not published during the years 100, 101, 102, ..., 277, 278. Note 279 is not counted since it was discovered at the beginning of the year 279. There are $278-100+1 = 179$ years in the list above.

Answer: 179

2. You cannot have 0 in the first position, so you put 1 in the first position, and 0 in the second.

Answer: 10234

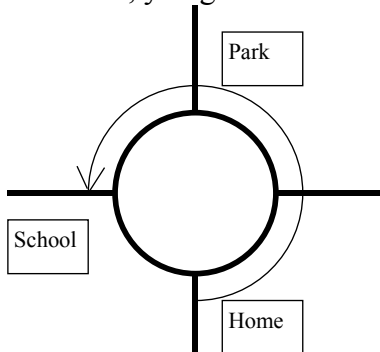
3. Count the chapter lengths of the 9 chapters. The average is $(50 + 10 + 40 + 20 + 30 + 50 + 30 + 30 + 10) \div 9 = 30$. Note: It was possibly to get this answer without calculation, by simply looking at symmetries in the graph.

Answer: 30

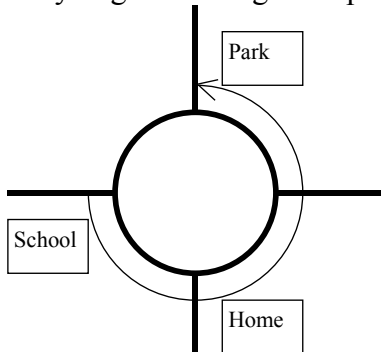
4. There are many patterns to help speed up the counting, but ultimately you have to count the number of dark edges.

Answer: 42

5. First, you go counterclockwise to the school, this takes 270° .



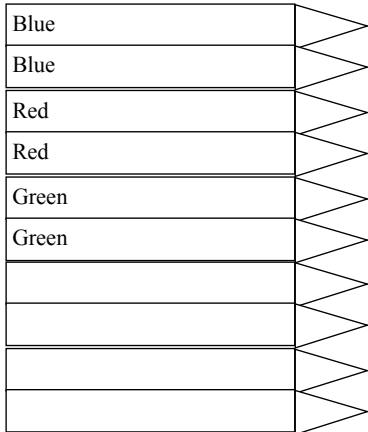
Then you go 270° to get the park.



In total you travelled $270^\circ + 270^\circ = 540^\circ$ (counterclockwise) around the roundabout.

Answer: 540

6. For you to have 7 different colours, each remaining pen must be a different colour. And you know there is a purple pen. So there is exactly 1 purple pen.



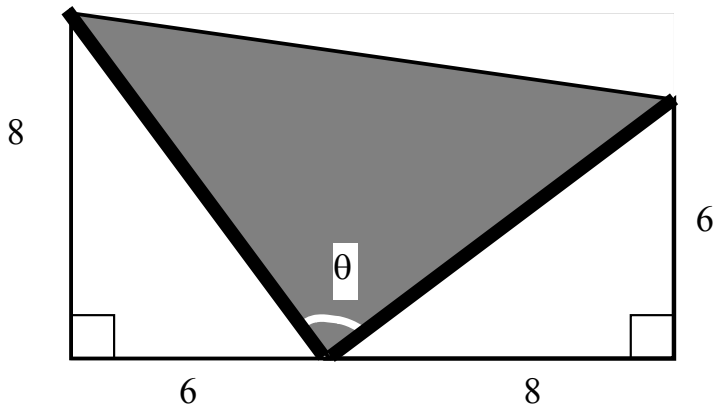
Answer: 1

7. It is very easy to see that 77 satisfies this property. There are no other possible answers; you can check this by trial and error, or some more clever method. You need to look through the other 2 digit multiples of 7: 14, 21, 28, 35, 42, 49, 56, 63, 70, 84, 91, 98.

Answer: 77

8. The area of the parallelogram is $(\text{Base1} + \text{Base2}) / 2 \times \text{Height} = (6 + 8) / 2 \times 14 = 98$. The area of each triangle is $(6 \times 8) / 2 = 24$. So the answer is $98 - 24 - 24 = 50$.
Or: Using Pythagorean Theorem: Both the darkened sides have length

$$\sqrt{6^2 + 8^2} = \sqrt{100} = 10$$



And the angle marked θ is 90° because the two unshaded triangles are congruent. So the shaded region is half of a square of side length 10. So the area is $\frac{1}{2} \times 10 \times 10 = 50$.
Note: This picture can thus be used to prove the Pythagorean Theorem!

Answer: 50