

1. We first count all the pages with a 2 in the units digit: 2, 12, 22, ..., 62. There are 7 of them. Then we must count all the pages with a 2 in the tens digit: 20, 21, 22, ..., 29. There are 10 of them.

However, notice we counted page 22 twice so we must subtract one of the extras. This gives us a total of $10 + 7 - 1 = \boxed{16}$ pages.

2. We first count every minute in which a 4 is displayed as a unit minute: 1:04, 1:14, 1:24, ..., 1:54, 2:04, ..., 2:54, ..., 12:54. There are 72 of them.

Next we must count every minute in which a 4 is displayed as a tens minute: 1:40, 1:41, 1:42, ..., 1:49, 2:40, ..., 2:49, ..., 12:49. There are 120 of them.

Next we must count every minute in which a 4 is displayed as an hour: 4:00, 4:01, 4:02, ..., 4:59. There are 60 of them.

Now we must take away minutes that we counted multiple times. 1:44, 2:44, 3:44, ..., 12:44 we counted twice each. That's 12 of them.

We also counted 4:04, 4:14, 4:24, ..., 4:54 twice each. That's 6 of them.

We also counted 4:40, 4:41, 4:43, 4:45, 4:46, 4:47, 4:48, 4:49 twice each. That's 9 of them.

Notice that we actually counted 4:44 three times, but I took away two of them already.

This gives us a total of $72 + 120 + 60 - 12 - 6 - 9 = \boxed{225}$ minutes.

3.

4.

5.

6. Since one student needs to row the boat back across the river after each trip, only 2 students may actually cross the river for each trip except the last. This means it takes a total of $13 \div 2 = 6R1$ trips. What this actually means is that the first 6 trips, 2 students cross each but the last trip the rower can get off as well. trips total.

7.

8.

9. If he gives seven candies to each student, he will have two left over. Let's use this information to start counting until we reach the minimum that can satisfy having three left over when giving five to each student.

9: If we give 5 to each student, we'll have 4 left over.



Math Olympiad and Problem Solving Program

F120 - Intermediate Problem Solving

Problem Set 29.2 - Period

Name:

Date:

16: If we give 5 to each student, we'll have 1 left over.

: If we give 5 to each student, we'll have 3 left over.

10. We first count all the pages that have 7 in the unit digit: 7, 17, 27, ..., 97. There are 10 of them.

Then we count all the pages that have 7 in the tens digit: 70, 71, 72, ..., 79. There are 10 of them.

However, we counted 77 twice so we must subtract one extra.

There are $10 + 10 - 1 = \text{$ pages.