

Tuesday, November 13, 2018 12:49 PM

Worksheet Review

(12) $26 \cdot 26 \cdot 26 \cdot 10 \cdot 10 \cdot 10 \cdot 10 = ?$

letters numbers

10 ways to choose a number

26 ways to choose a letter

What if no repeat letters or numbers allowed?
 $26 \cdot 25 \cdot 24 \cdot 10 \cdot 9 \cdot 8 \cdot 7$

(13) Phone number with area code
 • Area code must not begin with 0 or 1.

In old phone numbers,
 • second digit has to be 0 or 1

$(8 \ 2 \ 10) \cdot 8 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 = 8 \cdot 2 \cdot 8 \cdot 10^7 = 2(8 \cdot 8 \cdot 10^7)$

can't be 0 or 1 has to be 0 or 1

In new phone numbers

$(8 \ 10 \ 10) \cdot 8 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 = 8 \cdot 10 \cdot 8 \cdot 10^7 = 10 \cdot (8 \cdot 8 \cdot 10^7)$

this one is 5 times bigger than the old way

When do we divide?

How many 4-topping pizzas can you build with 10 possible toppings?

$\frac{10 \cdot 9 \cdot 8 \cdot 7}{4 \cdot 3 \cdot 2 \cdot 1}$

pick toppings

of ways to build some pizza

Troll Problem

- Troll 1: Exactly one of us is a Knave
- 2: Exactly one of us is a Knight
- 3: We're all Knaves

Suppose this is true. Then ③ must be the single Knave, and ② is a Knight. So ② says that exactly one troll is a Knight, which implies ① is a liar. Contradiction.

If he's a truth-teller, he's told you he's a Knave, which is a liar. That's a contradiction. He must be a Knave, and there must be at least