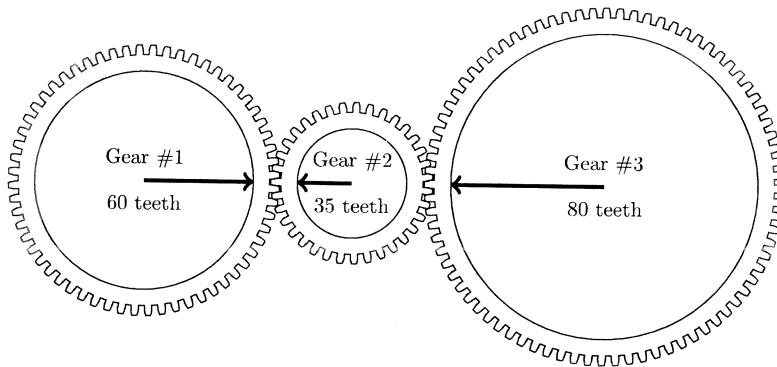


Math Challenge 2017
Pony Express

1. A jeweler has a 20 gram ring that is 60% gold and 40% silver. He wants to melt it down and add enough gold to make it 80% gold. How many grams of gold should be added?

Answer: 20

2. How many rotations of Gear #1 are required before all three gears return to the position shown, with the arrows lined up again and pointing in the same directions as before?



Answer: 28

3. If $x^2 + xy + y^2 = 84$ and $x - \sqrt{xy} + y = 6$, then what is xy ?

Answer: 16

4. Two boats on the opposite shores of a river start moving toward each other. When they pass each other they are 750 yards from one shoreline. They each continue to the opposite shore, immediately turn around and start back. When they meet again they are 250 yards from the other shoreline. Each boat maintains a constant speed throughout. How wide is the river?

Answer: 2000 yards

5. It takes three lumberjacks three minutes to saw three logs into three pieces each. How many minutes does it take six lumberjacks to saw six logs into six pieces each? Assume each cut takes the same amount of time, with one lumberjack assigned to each log.

Answer: 7.5

6. Six Math Challenge teammates, three boys and three girls, are randomly seated in six chairs in a row. What is the probability that no teammates of the same gender are seated next to each other?

Answer: 1/10