1. Jimmy gets on a plane at 2:46 PM in Washington DC. Due to the time change, it is three hours earlier in Seattle. He lands in Seattle at 4:30 PM. How many minutes did his flight last?

2. In the gear system in the picture, each of the two middle gears consist of one outer 32-tooth gear fixed to an inner 24-tooth gear. The leftmost 16-tooth gear makes 48 clockwise rotations per minute. How many clockwise rotations per minute does the rightmost gear make? Be sure to include a minus sign if the rotations are counterclockwise.

3. The 2003 edition of the Encyclopedia Britannica contains 32640 pages. What is the largest prime factor of 32640?

4. A bacteria strain repeatedly divides into two each day. If there is one bacterium on the first day, on what day will the number of bacteria exceed 1000?

5. Pascal’s triangle is constructed by filling in each digit by adding the upper left and upper right numbers. The figure shows Pascal’s Triangle down to the fifth row. What is the sum of the all the numbers in the seventh row?

6. A Sierpinski triangle can be constructed by starting with a point on the paper and repeatedly drawing left and right diagonals down from that point down to the next line. If two diagonals meet, they blow up and don’t start new diagonals. Not counting the diagonals that blow up, how many diagonals reach the eleventh line?

7. Amy shaved her head bald to be cool. Amy’s hair grew two inches every year. After the third year she cut off three inches and it weighed 5 ounces. After the fourth year she cut off three more inches. After two more years she decided to be bald and cut it all off. How much did all that hair weigh in ounces since the day she shaved her head? (Round your answer to the nearest ounce.)
1. Which of the figures lacks symmetry when spun around 180 degrees?

A B C D

2. A second timer counts down from 60 to 0 in one minute. What is the percent of the time that at least one of the digits will be a 4 if you randomly glance at it during the minute? (Round your answer to the nearest percent.)

3. If 6 squirrels can eat 6 tulips in 6 minutes, how many squirrels would it take to eat 12 tulips in 12 minutes?

4. A factorial of a number is that number times all the whole numbers smaller than it. Factorial is represented by an exclamation mark. For example 5! = 1 x 2 x 3 x 4 x 5 = 120. What is nine factorial (9!) divided by seven factorial (7!)?

5. A right-angle triangular wedge is three long and one foot wide. What is the maximum number of these triangles that can fit into a four foot by four foot square if flipping is allowed?

6. How many different digits from among 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9 are needed to write down the product of 37, 2, 3, and 4?

7. Mickey is watching a streaming download of a 90 minute movie. The size of the movie file being streamed is 600 MB (megabytes). Her DSL Internet service provides a 800 Kbps (kilobits per second) download rate. Since there are eight bits in a byte, this rate is 100 KB/s, which we can write 0.1 MB per second. How many minutes will it take to download the movie? Find your answer to the nearest minute.