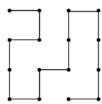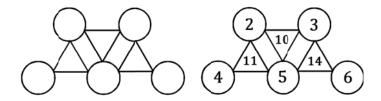1. In a classroom of 20 students, 40% of the students can find New Hampshire on a map, and 75% of the students can find New Mexico. If four students can't find either of the two states, how many students in the class could find both states?

2. Linda places a 4 by 4 grid of dots on her paper so that each dot is one inch horizontally and vertically from its nearest neighbors. She connects the dots by a continuous path as shown below, connecting all 16 dots. She then does the same with a 5 by 5 grid of dots, connecting each dot to an adjacent one until all of the dots are connected by one continuous path. What is the number of inches in the length of the path she traces on the 5 by 5 grid?

3. For how many ordered triples of *positive* integers (a, b, c) is $a + b + c = 8$?

4. What is the least positive integer that has exactly 8 factors?

5. Three of the side lengths of a quadrilateral are x, x^2, and x^3. The fourth side is 100 cm long. If each of the four sides has an integral length in centimeters, what is the perimeter of the quadrilateral?

6. Malcolm selects a two-digit integer. If he reverses the digits and places a 9 between them, the resulting three-digit integer is 7 times the original number. What was the original number?

7. The digits 2, 3, 4, 5, and 6 are arranged so that each fills one of the circles in the diagram below. Each triangle is then filled with the sum of the digits from the circles on its three vertices. Finally, the numbers in the three triangles are written in order to form an integer. For example, the integer formed in the example is 111,014. What is the smallest possible integer that can result from this process?

8. In an equiangular hexagon, the sum of the lengths of any two adjacent sides is equal to the sum of the lengths of the opposite pair of sides. For example, in equiangular hexagon ABCDEF, AB+BC=DE+EF, and BC+CD=EF+FA. Two hexagons are congruent if one can be transformed into the other by rotation or reflection. How many distinct, non-congruent equiangular hexagons have side lengths of 1, 2, 3, 4, 5, and 6 units?

1. 7
2. 24
3. 21
4. 24
5. 255 (cm)
6. 42
7. 10912 (34 on top, then 526)
8. 2 (1, 4, 5, 2, 3, 6 & 1, 5, 3, 4, 2, 6)