Problem 1. How many outfits can you make from 2 pairs of shoes, 3 pairs of pants, and 2 shirts?

Problem 2. How many different pizzas can you make if you have 2 types of cheese, sausage, pepperoni, and bell peppers? A pizza can have 1 or 2 types of cheese on it, and can have 0, 1, 2 or 3 extra toppings.

Problem 3. You have 10 pennies, 3 nickels, 4 dimes, and 1 quarter. How many different ways can you make

a) 40 cents?
b) 27 cents?
c) 35 cents?

Problem 4. Draw an equilateral triangle with vertices A,B, and C. If you change the order of the vertices, can you get a different triangle or do you get the same triangle just flipped or rotated? Explain your answer to someone in your group.

Problem 5. Draw a square with vertices A,B,C, and D. How many different (not just flipped or rotated!) squares can you get by changing the order of the vertices?

Problem 6. See if you can figure out the same problem for a regular pentagon (or an even larger shape!).

Problem 7. You want to choose a team of 3 people, and you have 5 people to choose from. How many ways can pick a different team?

Problem 8. You are planning a trip from Chicago, IL to St. Louis, MO (and back), and you have 4 transportation options. You can get a ride with a friend, or you can take Amtrak, Megabus, or Greyhound. You are allowed to use different options to leave and return. Amtrak has 3 times you can leave, and only 2 times you can return. Greyhound has 1 time you can leave, and 2 times you can return. Megabus has 2 times you can leave, and 2 times you can return. Your friend won't move his plans, so you can only leave at 1 time and return at 1 time if you drive. How many different ways could you plan your trip? Hint: Drawing a graph (or two!) can help you solve this problem.

Problem 9. A class of 6 students has to split up into pairs. How many ways is this possible?

Problem 10. Can you do the same problem for a class of 10 students? How about 20 students?