

Name: Key

Math 221: Quiz 1 - 6/3/15

Solve the following problems. Write down the methods you used when trying to solve the problems.

1. Determine the value of $3 + 6 + 9 + 12 + \dots + 30$ without using a calculator. [50 Points]

$$\begin{array}{c} 3+6+9+\dots+24+27+30 \\ \left[\begin{array}{c} \left[\begin{array}{c} \left[\begin{array}{c} \left[\begin{array}{c} \left[\begin{array}{c} 33 \\ 33 \end{array} \end{array} \right] \\ 33 \end{array} \right] \\ 33 \end{array} \right] \\ 33 \end{array} \right] \end{array} \right] \end{array} \right] \end{array}$$

There are 10 numbers and hence 5 pairs, so the sum is $33 \times 5 = \boxed{165}$

Alternate way:

$$\begin{aligned} & 3(1+2+3+4+5+6+7+8+9+10) \\ & = 3\left(\frac{10(11)}{2}\right) = 3(55) = \boxed{165} \end{aligned}$$

2. On the worksheet, we considered the number of regions formed by connecting points on a circle. For 2 points, we found 2 regions. For 3 points, we found 4 regions. For 4 points, we found 8 regions. For 5 points, we found 16 regions, and thus we predicted that the pattern was doubling each time. So, we expected 32 regions for 6 points, but instead we found 30. What does this say about searching for patterns? Write about 2-3 sentences for this problem. [50 Points]

When you think you've found a pattern, you must check it. In the example above, the numbers appeared to be doubling, but graphically, it wasn't clear why. You must always know why a pattern works in order to assume patterns in the numbers alone.