Problem Set 1

Problem 1

(A) Consider a stack of three tennis balls. Is the height of the stack less or greater than the circumference of one tennis ball?

(B) Now answer the same question with ping-pong balls. Is the answer the same or different?

(C) Now make a statement about 3 stacked spheres in general. Explain/prove your statement.

Problem 2

Suppose there are n people in a math 196L class. If they all shook hands with each other what is the total number of handshakes?

Problem 3

Suppose there are *n* people in a math 196L class. If person A shakes hands with person B who shakes hands with person C who again shakes hands with person A, we have a group of 3 people. What is the total number of such possible groups in the class? (Equivalent to 3 people fist-bump)

Problem 4

(A) A coin is flipped 10 times, and the number of heads and tails is counted. How many different ways can one get exactly 3 heads?

(B) A coin is flipped *n* times, and the number of heads and tails is counted. How many different ways can one get exactly 3 heads?

Algebra Practice:

1. $$\frac{\frac{1}{3}\left(x^2+7\right)^{1/2}-2x\left(x^2+7\right)^{-1/2}}{\left(x^2+7\right)}$$

2. $$\frac{\frac{3}{(x+h)^2}-\frac{3}{x^2}}{h}$$

3. Write in complete <u>factored</u> form:
$$6(z-3)^4-7(z-3)^3(2z-1)$$