READ PROBLEMS CAREFULLY ☺

CROSSROADS ACADEMY
MATHCOUNTS PREPARATION

1. Word Problems

(1) How many minutes are there in a year that occur in prime numbered hours?

(2) If the area of a rectangle with integer sides is 70cm what is the smallest possible perimeter of the rectangle?

(3) You flip a coin and if you get heads you roll a die. What is the probability that you roll a square number?

(4) How many ways are there to make 75 cents in change without using pennies?

(5) What is the smallest number whose square is at least 12345?

(6) You have a jar with 6 green marbles and 4 red marbles, if you draw two marbles without replacement what is the probability that at most one is red?

(7) A cone with base radius of 6in and height 6in is filled with water and poured into a cylinder of radius 8in and height 8in. What percentage of the cylinder is filled?

(8) When a balloon floats past a certain altitude it loses 2/3 of its surface area every minute. If the balloon initially has a radius of 12m how many full minutes does it take until the volume of the balloon is less than .1m?

(9) If you have two spheres, one of radius 10ft and one of radius 6ft, what percentage of the volume of the smaller sphere is the difference in volumes between the spheres?

(10) How many ways are there to arrange the letters in "HALLOWEEN" if vowels are not allowed to be placed next to each other, no letters that appear multiple times can be placed next to each other, and letters that are next to each other in "HALLOWEEN" can't be next to each other?

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2. Rounding Problems

(1) In a right triangle with legs of length 13 and 21 what is the length of the hypotenuse to the nearest integer?

(2) What is the ratio of a circle's circumference to its diameter to the nearest thousandth?

(3) What is the probability that the top card of a shuffled deck is a face card to the nearest tenth?

(4) How many different combinations of 3 pizza toppings can be chosen if 8 toppings are available to the nearest 10?

(5) If a square has a diagonal of 2in what is the area of the square to the nearest integer?

(6) How many square feet are in a square mile to the nearest thousand?

(7) How many cubic inches are in a cubic yard to the nearest hundred?

(8) What is the probability that a point chosen at random within a square is within the inscribed circle to the nearest integer?

(9) What is the probability that a real number chosen at random between 0 and 1 is closer to .2 than to .3 or closer to .9 than to .8 to the nearest half integer?

(10) What is the difference between the sum of the reciprocals of the first 10 integers and the reciprocal of the sum of the first 10 integers to the nearest integer?