9/30 Countdown Round

GET IN TEAMS OF 4-5!!!!

Countdown Round Rules

- Each team sends one person up to the tables
- Rotate team members (person A does question 1, person B does question 2, person C does question 3, …)
- First to answer correctly gets 3 pts, second gets 2, third gets 1
- When you have your answer write it down, box it, and raise your hand (in that order) and we'll check

Practice Question (Q0)

I’m thinking of an integer from 1-10 inclusive. What is that number?

Question 1 (for real)

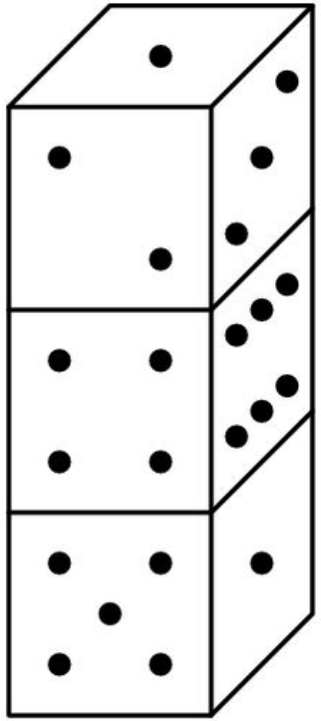
Compute 1+4+7+...+22

Question 2

What is 510% of 33? Round to the nearest ten (ex: 234 -> 230, 456 -> 460)

Question 3

3 six-sided die each numbered 1,2,3,4,5,6 on their sides are stacked in the diagram to the right. How many dots are not shown?



Question 4

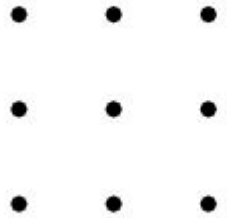
What is the area of a triangle with side lengths 65, 39, 52?

Question 5

A convex quadrilateral has vertices at (3, 2), (3, -2), (-3, -2), (-3, 0). What is its area?

Question 6

I decide to choose a random set of 3 points from the grid to the right. What is the probability that they lie in a straight line?



Question 7

For any three real numbers a, b, and c, with b != c, the operation $ is defined by: $(a,b,c)=a/(b-c). What is $($(1,2,3), $(2,3,1), $(3,1,2))?

Question 8

How many non-congruent triangles with perimeter 7 have integer side lengths?

Question 9

Compute the last digit of 2027^(1+2+...2028).

Question 10

The sum of the two 5-digit numbers “AMC10” and “AMC12” is 123422. What is A+M+C?

Question 11 (voided)

Let there be a rectangle with vertices (0, 0), (4, 0), (10, 4), (3, 4). Choose a random point (x, y) within this rectangle. What is the probability that y>x?

Question 12

What is the probability that a random integer within the first 100 positive integers is divisible by 2 and 3 but not 5?

Question 13

Find the sum of the reciprocals of the roots of the equation:

$$\frac{2003}{2004}x + 1 + \frac{1}{x} = 0?$$

Question 14

For how many positive integers n is n^2-3n+2 a positive integer?

Question 15

Find the smallest positive integer with exactly 28 divisors.

Question 16

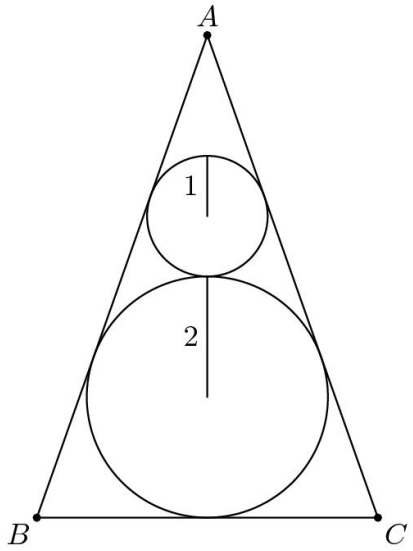
The product of 3 consecutive positive integers is 8 times their sum. What is the sum of their squares?

Question 17

Positive integers a, b satisfy ab+3a-4b = 100. Find the sum of all possible values of a.

Question 18

A circle of radius 1 is tangent to a circle of radius 2. The sides of ABC are tangent to the circles as shown, and the sides AB and AC are congruent. What is the area of ABC?



Question 19

The awkward steps near the DVHS gym have 2 sections, with 13 and 14 steps, respectively. Walking up, I can either take 1 or 2 steps at a time. However, I cannot “skip” from the first section into the second; i.e. I cannot go from step number 12 of the first section to step number 1 of the second. How many ways are there for me to walk down the steps?

Question 20

A cube’s face’s centers are marked and connected to form an octahedron. The side length is 4. What is the volume of this octahedron?