Bergen County Math League

Calculators Permitted

Good Luck to You 

Good Luck to All

Contest #3 **2024-2025** **12 minutes** **Questions 1 & 2**

3-1. In a contest, a total of \$1500 was given away in \$1, \$7, \$49, and \$343 prizes. No prize was awarded more than six times. How many \$1 prizes were given away in this contest?

3-2. In ΔABC, $m\angle A = 45$ and $m\angle B > m\angle C$. The length of the altitude from B is 6, and the perimeter of the triangle is $24 + 6\sqrt{2}$. Find the area of ΔABC.

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Contest #3 **2024-2025** **12 minutes** **Questions 3 & 4**

3-3. If $5x^3 + 3x^2 - 4x + 7 = a + b(x-1) + c(x-1)^2 + d(x-1)^3$ is an identity for all real values of x, find the value of a.

3-4. Find the radius-length of the circle whose area is tripled when the length of its radius is increased by 2.

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Contest #3 **2024-2025** **12 minutes** **Questions 5 & 6**

3-5. The function f, defined on the positive integers, satisfies

$$f(n) + f(n+1) = 11 - n$$

for all integral values of n from 1 through 8 inclusive. If

$$f(9) + f(1) = 2,$$

find the value of $f(1)$.

3-6. Arcs ABC and ADC are different semicircles of the same circle of which $\overline{AB}$ and $\overline{AD}$ are chords. Further, AB = 2 and AD = 5. From points B and D, perpendiculars are drawn to $\overline{AC}$, intersecting $\overline{AC}$ at points E and F respectively. If AE = x, EF = 3, and FC = y, find the sum $x + y$.