

**Bergen County Math League
Calculators Permitted**



Contest #3

2023-2024

Answers/Solutions

3-1. **Answer:** 16 feet

As X is three feet, Z must be six feet plus one-fourth of itself. Therefore, three-fourths of Z is six feet, making Z eight feet and Y five feet. Adding X, Y and Z you get 16 feet as the answer.

3-2. **Answer:** (21, 15)

Work backward:

A		B
18		18
6		30
21		15

$$(a, b) = (21, 15)$$

3-3. **Answer:** 198 days

Every day it increased its height one-half of its original height [for example, $\frac{1}{3}\left(1 + \frac{1}{2}\right) = \frac{1}{2}$, $\frac{1}{4}\left(1 + \frac{1}{2} + \frac{1}{2}\right) = \frac{1}{2}$, *etc.*]. In order to become 100 times its original height, it must reproduce its height 99 times, which will take 198 days.

3-4. **Answer:** 99 matches

Each match eliminates 1 person \Rightarrow 99 matches

3-5. **Answer:** (89, 97)

Since $\sqrt{8633} \approx 92.9$, the search should begin in the neighborhood of 93. The answer is (89, 97).

3-6. **Answer:** 0

The area of the lighter shaded region is $\pi(3^2) = 9\pi$, and the area of the darker shaded region is $\pi(5^2) - \pi(4^2) = 25\pi - 16\pi = 9\pi$. The difference is $9\pi - 9\pi = 0$.