

MBMT Algebra Round — Euclid

Full Name _____

Team Number _____

DO NOT BEGIN UNTIL YOU ARE INSTRUCTED TO DO SO.

This round consists of **8** questions. You will have **30** minutes to complete the round. Each question is **not** worth the same number of points. Questions answered by fewer competitors are weighted more heavily. Please write your answers in the simplest possible form.

_____ 1. Arnold has 6 basketballs. 2 of them weigh 4 pounds each and the other 4 weigh 2 pounds each. What is the total weight, in pounds, of the 6 basketballs?

_____ 2. Evaluate $18 + 54 \div 9 * 3$.

_____ 3. The sequence E_n has the property that the first term is 20, the second term is 16, and starting from third term, each term is the sum of the previous 2 terms. What is the fifth term?

_____ 4. If $n^4 = 2^{12}$ and n is positive, what is n ?

_____ 5. Alice and Bob each have a sack of 50 apples. All apples are either red or green. If Alice has three times as many red apples as Bob does and half as many green apples as Bob does, how many red apples does Alice have?

_____ 6. What is the sum of the coefficients of the expansion of $(4x^2 + 10x - 1)^2$?

_____ 7. What is the sum of the squares of the roots of the polynomial $x^3 - x^2 - 9x + 9$?

_____ 8. $f(x)$ has the property that $5f(x) - 3f\left(\frac{1}{x}\right) = x^3$ for all nonzero x . Find $f(\sqrt[3]{6})$.