Part I *Time Limit:* 12 *minutes*   Answers must be exact or have 4 (or more) significant digits, correctly rounded.

6-1. If $n!$ is the product of the first n positive integers, what is the value of n for which
$$n! = \frac{2017! - 2016!}{2016}?$$

6-2. How many of the first 50 positive integers have prime number of positive divisors?

Part II *Time Limit:* 12 *minutes*

6-3. What is the least value n for which n, $1.125n$, and $1.44n$ are positive integers?

6-4. Jerry, Steve, and Dan were racing on the track in the gym. They started at the same time and at the same place and ran at constant speeds. After the first 20 minutes, Jerry was ahead of Steve by 1 full lap. After another 10 minutes, Jerry was ahead of Dan by 1 full lap. *From this time*, how many minutes later, will Dan be ahead of Steve by 1 full lap?

Part III *Time Limit:* 12 *minutes*

6-5. If P is a cubic polynomial such that $P(0) = 5$ and $P(1) + P(-1) = 32$, what is the value of $P(2) + P(-2)$?

6-6. In $\triangle ABC$, let a, b, and c be the sides opposite $\angle A$, $\angle B$, and $\angle C$ respectively. What is $m\angle B$ if $\dfrac{c}{a+b} + \dfrac{a}{b+c} = 1$?

Answers

6-1. 2016
6-2. 20
6-3. 200
6-4. 30
6-5. 98
6-6. 60 or 60°