Some problems on IVT

November 12, 2015

Problems

Problem 1. You decide to estimate e^2 by squaring longer and longer decimal approximations of $e = 2.71828\ldots$.

1. This is a good idea because e is a rational number.
2. This is a good idea because $y = x^2$ is a continuous function.
3. This is a bad idea because e is an irrational number.
4. This is a good idea because $y = e^x$ is a continuous function.

Problem 2. True or false: You were once exactly 3 feet tall.

Problem 3. True or False: At some time since you were born your weight in pounds equaled your height in inches.

Problem 4. True or False: Along the Equator, there are two diametrically opposite sites that have exactly the same temperature at the same time.

Problem 5. Suppose that during half-time at a basketball game the score of the home team was 36 points. **True or False**: There had to be at least one moment in the first half when the home team had exactly 25 points.

Problem 6. True or False: $x^{100} - 9x^2 + 1$ has a root in $[0, 2]$.