Pop Quiz

Math 113-001/6 College Algebra
Colorado Mesa University Fall 2022

1. The following expression is equal to $z^{\square}$ for some number $\square$. What number must $\square$ be?

$$\frac{\sqrt{\left(z^3\right)^3 z^8}}{z^5}$$

2. What number is $\log_7\left(\mathrm{e}^3\right)$ equal to? Write this number as a decimal accurate to five digits,

3. If $\log_3(x) = 7$, what number must $\log_3\left(81x^2\right)$ be equal to?

4. The percent of Americas who are medically classified as *obese* from 1990 projected through 2030 can be modeled by $f(t) = -31.75 + 18.5\ln(t)$, with t equal to the number of years after the year 1980.

   (a) What percentage of Americans would currently be classified as obese according to this model?

   (b) Does this model suggest obesity is become more frequent or less frequent among Americans?

   (c) The fact that t is the number of years after 1980 when the domain of the model starts at 1990 is a tad silly. How would the formula $f(t)$ have to change if instead t were the number of years after 1990?

   (d) This model is proposed to become inaccurate beyond the year 2030. Ignoring that limitation, for what year does this model predict that *every single American* will be obese?