Quiz 5  MAC1147, PRECALC AND TRIG, SPRING 2017

SECTION: PER 3  NAME: Key

Problem 1. Does knowledge exist? If so, how could you be sure when you have it? (One popular criteria is that knowledge be a justified true belief)

Problem 2. Perform the operation and write the result in standard form:

\[
\frac{2i}{2i^2} + \frac{5}{2-1} - \frac{2i(2-1)}{(2i)(2-1)} = \frac{2i^2 + 5}{4 + 1} + \frac{10 + 5i}{4 + 1} = \frac{12 + 9i}{5}
\]

Problem 3. Let \( n \) be a positive integer. Use division to simplify the following:

Let \( y = x^n \), then it becomes:

\[
\frac{x^{3n} - 7x^6 + 6}{x^n - 2} = \frac{y^3 - 7y + 6}{y^2 - 2}
\]

So we get \( \frac{y^3 - 7y + 6}{y^2 - 2} = y^2 + 2y - 3 \).

Substitute \( y = x^n \), then \( \frac{x^{3n} - 7x^6 + 6}{x^n - 2} = \frac{2^n}{x^2 + 2x - 3} \)

Problem 4. Write the equation of a 6th degree polynomial \( f(x) \) given that \( f(x) = 0 \) for \( x = 3, x = -9 \) and \( x = -12/7 \). Do the same for a 5th degree polynomial \( g(x) \) where \( g(x) = 0 \) for \( x = 3, x = -9 \) and \( x = -12/7 \).

Let's of answers:

\[
f(x) = (x - 3)(x + 9)(x + \frac{12}{7})(x - a)(x - b)(x - c)
\]

\[g(x) = (x - 3)(x + 9)(x + \frac{12}{7})(x - d)(x - e)\]

Pick any real number for \( a, b, c, d, e \), but they need to be there for \( f \) to be degree 6, and \( g \) degree 5.