AP Calculus AB
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Activity 0827
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Name:

Problem 1. Let $f(x) = x^3 - 5x^2 + 7x - 3$. Note that $f(1) = 0$, so $f(x) = (x-1)q(x)$ for some quadratic polynomial $q(x)$. Use synthetic division to factor out $x - 1$ and find $q(x)$. Factor $q(x)$. Solve $f(x) = 0$ and correctly write the solution set.

Problem 2. Let $f(x) = x^3 - 2x^2 + 4x - 8$. Factor f into linear factors. Solve $f(x) = 0$ and correctly write the solution set.

Problem 3. Let $f(x) = 3x^2 - 17x + 10$. Suppose that $f(x)$ factors as $f(x) = (3x + p)(x + q)$.
Find p and q. Solve $f(x) = 0$ and correctly write the solution set.

Problem 4. State the natural domain of the given function. Use correct set notation.

(a) $f(x) = \sqrt{x-1}$

(b) $f(x) = \dfrac{1}{x-2}$

(c) $f(x) = \log(x-3)$

(d) $f(x) = \sqrt{x^2-8x+15}$

(e) $f(x) = \dfrac{1}{x^2-8x+15}$

(f) $f(x) = \log(x^2-8x+15)$

Problem 5. Let $g(x) = \sqrt{100-x^2}$ and $h(x) = \dfrac{1}{x^2-25}$. Find the domain of the given function.

(a) $f(x) = g(x) + h(x)$

(b) $f(x) = \dfrac{g(x)}{h(x)}$

(c) $f(x) = g(h(x))$

(d) $f(x) = h(g(x))$