Quick Quiz for AP* Preparation: Sections 2.1 and 2.2

You should solve the following problems without using a graphing calculator.

1. **Multiple Choice** Find $\lim_{x \to 3} \dfrac{x^2 - x - 6}{x - 3}$, if it exists.

(A) -1 (B) 1 (C) 2 (D) 5 (E) does not exist

2. **Multiple Choice** Find $\lim_{x \to 2^+} f(x)$, if it exists, where

$$f(x) = \begin{cases} 3x + 1, & x < 2 \\ \dfrac{5}{x + 1}, & x \geq 2 \end{cases}$$

(A) 5/3 (B) 13/3 (C) 7 (D) ∞ (E) does not exist

3. **Multiple Choice** Which of the following lines is a horizontal asymptote for

$$f(x) = \frac{3x^3 - x^2 + x - 7}{2x^3 + 4x - 5}?$$

(A) $y = \dfrac{3}{2}x$ (B) $y = 0$ (C) $y = 2/3$ (D) $y = 7/5$ (E) $y = 3/2$

4. **Free Response** Let $f(x) = \dfrac{\cos x}{x}$.

(a) Find the domain and range of f.

(b) Is f even, odd, or neither? Justify your answer.

(c) Find $\lim_{x \to \infty} f(x)$.

(d) Use the Sandwich Theorem to justify your answer to part (c).