

★ means Advanced problem.

Section 2.5, 2.6, 2.7

1. Find the limit

$$\lim_{x \rightarrow -\infty} \left(5 + \frac{100}{x} + \frac{\sin^4(x^3)}{x^2} \right)$$

2. Find the limit

$$\lim_{x \rightarrow \infty} \frac{4x^2 - 7}{8x^2 + 5x + 2}$$

3. Find the limit

$$\lim_{x \rightarrow \infty} \frac{\sqrt{36x^2 + 2x + 7}}{3x}$$

4. Find the value of constant k that makes the function continuous

$$f(x) = \begin{cases} x^3 + k & \text{if } x \leq 3 \\ kx - 5 & \text{if } x > 3 \end{cases}$$

5. Where is the function discontinuous? Find the limit at each discontinuity.

$$f(x) = \frac{-2x}{(2x+1)(3x+6)}$$

6. Use the limit proof to show the limit exists

$$\lim_{x \rightarrow 2} 3x + 5 = 11$$

7. Use the limit proof to show the limit exists

$$\lim_{x \rightarrow 1} \frac{5x + 3}{4} = 2$$