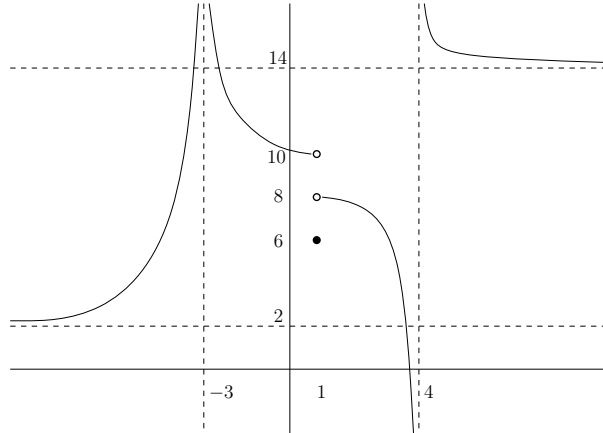# Calculus I Exam One

Name: _____

Please show all work on these problems. Use of a calculator is not permitted.

1. Based on the graph of f given below, find the following.

(a) $\lim_{x \to -3^-} f(x)$

(b) $\lim_{x \to -3^+} f(x)$

(c) $\lim_{x \to -3} f(x)$

(d) $f(-3)$

(e) $\lim_{x \to 1^-} f(x)$

(f) $\lim_{x \to 1^+} f(x)$

(g) $\lim_{x \to 1} f(x)$

(h) $f(1)$

(i) $\lim_{x \to 4^-} f(x)$

(j) $\lim_{x \to 4^+} f(x)$

(k) $\lim_{x \to 4} f(x)$

(l) $f(4)$

(m) $\lim_{x \to \infty} f(x)$

(n) $\lim_{x \to -\infty} f(x)$

Find the following limits.

2. $\lim_{x \to 4} \frac{x^2+2x-24}{x^2-16}$.

3. $\lim_{x \to -\infty} \frac{-3x^7-2x^4+8}{-5x^4-9}$

4. $\lim_{x \to \infty} \frac{\sqrt{64x^{10}-6x^7+2}}{7x^5-9x^3+5}$

5. $\lim_{x \to 25} \frac{\sqrt{x} - 5}{x + 1}$

6. $\lim_{x \to -\infty} x^7 + x^6$

7. $\lim_{x \to 3} \frac{\frac{1}{x} - \frac{1}{3}}{x - 3}$

8. $\lim_{x\to 4^+} \frac{7-x}{x-4}$

9. $\lim_{x\to 4} \frac{x-4}{\sqrt{x}-2}$

10. Find all vertical and horizontal asymptotes of the function $f(x) = \frac{3x^2+12x}{x^2-x-20}$.

11. Calculate $\dfrac{6e^{4x} - 6}{12x}$ for $x = 0.1, 0.01, 0.001, 0.0001$. Use this information to estimate $\displaystyle\lim_{x\to 0^+} \dfrac{6e^{4x} - 6}{12x}$.

12. Suppose $f(x) = 5e^{-2x}$.

(a) Find $\lim_{x\to\infty} f(x)$ and $\lim_{x\to-\infty} f(x)$.

(b) Find all of this function's vertical and horizontal asymptotes.