

AP Calculus AB

Limits at Infinity Practice

HW 1-9

Name: _____

Find the limit.

1) $\lim_{x \rightarrow \infty} \frac{5x^2 - 3x + 1}{2x^2 + 4x - 7}$

2) $\lim_{x \rightarrow \infty} \frac{3x^3 - x + 1}{6x^3 + 2x^2 - 7}$

3) $\lim_{x \rightarrow \infty} \frac{4x - 3}{\sqrt{x^2 + 1}}$

4) $\lim_{x \rightarrow -\infty} \frac{4 - 7x}{2 + 3x}$

5) $\lim_{x \rightarrow \infty} \frac{2x^2 - x + 3}{x^3 + 1}$

6) $\lim_{x \rightarrow -\infty} \frac{x^2 + 2}{x - 1}$

7) $\lim_{x \rightarrow -\infty} \frac{2 - x^2}{x + 3}$

8) $\lim_{x \rightarrow \infty} \sqrt{\frac{8 + x^2}{x(x+1)}}$

9) $\lim_{x \rightarrow \infty} \cos x$

10) $\lim_{x \rightarrow \infty} \left(-2x^3 + 1 - \frac{5}{x} + \frac{12}{x^4} \right)$

11) $\lim_{x \rightarrow -\infty} \left(\frac{-5}{2x^3} - 7 + \frac{8}{x} \right)$

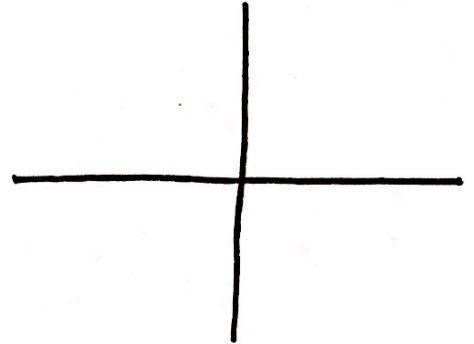
12) $\lim_{x \rightarrow -\infty} \left(3 + \frac{5}{x^3} - \frac{7}{6x} \right)$

13) $\lim_{x \rightarrow \infty} \frac{\sin 4x}{3x}$

Sketch a possible graph given the set of conditions. Assume the function does not cross a horizontal asymptote.

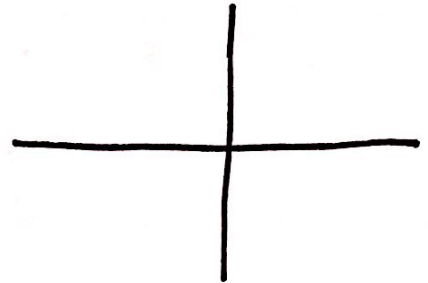
$$14) \lim_{x \rightarrow -\infty} f(x) = 1 \quad \lim_{x \rightarrow 3^-} f(x) = -\infty$$

$$\lim_{x \rightarrow \infty} f(x) = 1 \quad \lim_{x \rightarrow 3^+} f(x) = \infty$$



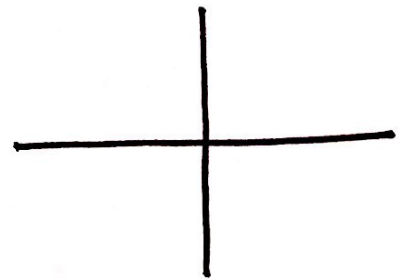
$$15) \lim_{x \rightarrow -\infty} f(x) = -1 \quad \lim_{x \rightarrow 2^-} f(x) = \infty$$

$$\lim_{x \rightarrow \infty} f(x) = -1 \quad \lim_{x \rightarrow 2^+} f(x) = -\infty$$



$$16) \lim_{x \rightarrow -\infty} f(x) = -2 \quad \lim_{x \rightarrow \infty} f(x) = -2$$

$$\lim_{x \rightarrow 3^-} f(x) = \infty \quad \lim_{x \rightarrow 3^+} f(x) = -\infty$$



$$17) \lim_{x \rightarrow -\infty} f(x) = 3 \quad \lim_{x \rightarrow \infty} f(x) = 3$$

$$\lim_{x \rightarrow 1^-} f(x) = \infty \quad \lim_{x \rightarrow 1^+} f(x) = -\infty$$

