

Limits at Infinity Worksheet - Answer Key

Find each limit, if it exists.

$$1. \lim_{x \rightarrow \infty} \frac{(2x)^2}{(2)^2 x}$$

∞

$$6. \lim_{x \rightarrow \infty} \frac{5^x}{\ln(x^3 + 2x + 1)}$$

∞

$$2. \lim_{x \rightarrow \infty} \frac{x-5}{e^x}$$

0

$$7. \lim_{x \rightarrow \infty} \frac{x^3 - 2x^2 + 1}{5x - 9x^4 + x^2}$$

∞

$$3. \lim_{x \rightarrow \infty} 1000 \sin(1000x)$$

The limit does not exist.

$$8. f(x) = \frac{6x + 5 + \frac{2}{x}}{x}$$

6

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

$\frac{2}{3}$

$$9. \lim_{x \rightarrow \infty} \frac{2(\ln x)^2 + 5x - 7}{9x^2 + x - 11}$$

0

$$5. \lim_{x \rightarrow \infty} \frac{x}{2^x}$$

0

$$10. \lim_{x \rightarrow \infty} \frac{e^{\frac{1}{x}}(x + \frac{2}{x} - 3)}{x - 2}$$
$$\lim_{x \rightarrow \infty} \frac{e^{\frac{1}{x}}(x - 2)(1 - \frac{1}{x})}{x - 2} = 1$$

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