

Strategies for Finding Limits

p. 108 - 114 (2.3)

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1. Look at the graph or table
2. Try direct substitution
3. Try factor, cancellation technique
4. Multiply by the conjugate

For substitution:

Let b and c be real numbers and n be a positive number.

$$\lim_{x \rightarrow c} b = b \qquad \lim_{x \rightarrow c} x = c \qquad \lim_{x \rightarrow c} x^n = c^n$$

For polynomials, radicals, and composite functions, direct substitution will find the limit of a real number.

For rational and trigonometric functions, as long as the limit does not converge to a vertical asymptote, direct substitution finds the limit.

Find the limits:

$$1. \lim_{x \rightarrow 2} \frac{\sqrt{3x^2}}{x} \qquad 2. \lim_{x \rightarrow 1} \frac{x^2 + 5x - 6}{x - 1} \qquad 3. \lim_{x \rightarrow \pi/6} (\cos(x))$$

$$** 4. \text{ If } a \neq 0, \text{ then } \lim_{x \rightarrow a} \frac{x - a}{x^4 - a^4} \text{ is } \underline{\quad}. \qquad 5. \lim_{x \rightarrow \pi} x(\sec(x))$$

$$**6. \text{ If } g(x) = 3x^3 - 5, \text{ then } \lim_{x \rightarrow 0} \frac{g(x) - g(0)}{x^3} \text{ is } \underline{\quad}.$$