CalcDrill / Formula Pack

Calculus I & II | 32 worked concepts

01 LIMITS AND CONTINUITY

Direct substitution

$$\lim_{x \to a} f(x) = f(a)$$

WHEN TO USE:

Use when the expression is continuous at a.

TRY IT:

$\lim_{x \to 2} (x^2 + 3x)$

WORK:

$2^2 + 3 \cdot 2 = 10$

ANSWER:

10

Factor a zero over zero

$$x^2 - a^2 = (x - a)(x + a)$$

WHEN TO USE:

Factor first, then cancel away from the excluded point.

TRY IT:

$\lim_{x \to 3} \frac{x^2 - 9}{x - 3}$

WORK:

$\lim_{x \to 3} (x + 3) = 6$

ANSWER:

6

Rationalize a radical

$$\frac{\sqrt{x} - a}{x - a^2} = \frac{1}{\sqrt{x} + a}$$

WHEN TO USE:

Multiply by the conjugate before taking the limit.

TRY IT:

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

WORK:

$\frac{1}{\sqrt{4} + 2} = \frac{1}{4}$

ANSWER:

0.25

One-sided limits

$$\lim_{x \to a} f(x) \text{ exists if } L_- = L_+$$

WHEN TO USE:

Check both sides at a piecewise break.

TRY IT:

$f(x) = x + 1 \ (x < 2), \quad f(x) = 3 \ (x \geq 2)$

WORK:

$L_- = 2 + 1 = 3, \quad L_+ = 3$

ANSWER:

3

SAMPLE

Watermarked sample - full pack: 8 pages / 32 concepts