Limits — Factor and cancel

Name: _____ Date: _____

Substituting makes the top and bottom both 0: factor first, then cancel.

1 $\lim_{x \to -2} \frac{x^2 + 3x + 2}{x^2 - x - 6}$

$x = -2$: $\frac{0}{0}$

$\lim_{x \to -2} \frac{(x + 2)(x + 1)}{(x + 2)(x - 3)}$

$= \lim_{x \to -2} \frac{x + 1}{x - 3}$

$= \frac{-1}{-5}$

$= \frac{1}{5}$

2 $\lim_{x \to -2} \frac{x^2 + 5x + 6}{x^2 - x - 6}$

3 $\lim_{x \to -3} \frac{x^2 + x - 6}{x^2 - 9}$

4 $\lim_{x \to 2} \frac{x^2 - 3x + 2}{x^2 - 2x}$

5 $\lim_{x \to 1} \frac{x^2 - 1}{x^2 + x - 2}$

6 $\lim_{x \to -3} \frac{x^2 + 3x}{x^2 + 2x - 3}$

Limits · Factor and cancel — Answer key

1. $\lim_{x \to -2} \frac{x^2 + 3x + 2}{x^2 - x - 6} = \frac{1}{5}$

2. $\lim_{x \to -2} \frac{x^2 + 5x + 6}{x^2 - x - 6} = -\frac{1}{5}$

3. $\lim_{x \to -3} \frac{x^2 + x - 6}{x^2 - 9} = \frac{5}{6}$

4. $\lim_{x \to 2} \frac{x^2 - 3x + 2}{x^2 - 2x} = \frac{1}{2}$

5. $\lim_{x \to 1} \frac{x^2 - 1}{x^2 + x - 2} = \frac{2}{3}$

6. $\lim_{x \to -3} \frac{x^2 + 3x}{x^2 + 2x - 3} = \frac{3}{4}$