Problem:

Find the limit:

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

Solution:

$$\lim_{x\to 3}\frac{x^2-2x-3}{x^2-x-6}=\lim_{x\to 3}\frac{(x-3)(x+1)}{(x-3)(x+2)}=\lim_{x\to 3}\frac{x+1}{x+2}=\frac{\lim\limits_{x\to 3}(x+1)}{\lim\limits_{x\to 3}(x+2)}=\frac{3+1}{3+2}=\frac{4}{5}.$$

Answer: $\frac{4}{5}$.