

**Problem Definition**

Problem 31. Find the limit if it exists.

$$\lim_{x \rightarrow -3} \frac{2}{x + 2}$$

**Solution Step 1:**

Since this is a rational function of polynomials, the first step is to evaluate each of the polynomials separately. We can do this when the function in question is a polynomial. The limit for the numerator is

$$\lim_{x \rightarrow -3} 2 = 2$$

since the value, 2, is constant with respect to  $x$ . The limit for the denominator is

$$\lim_{x \rightarrow -3} (x + 2) = (-3 + 2) = -1$$

**Solution Step 2:**

If the limit in the denominator is not zero, we can evaluate the original limit

$$\lim_{x \rightarrow -3} \frac{2}{x + 2}$$

using the ratio of the two limits from the previous step. This gives the value

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