

Consider the functions $f(x) = \frac{ax^2 - b}{x^2 - 4}$ and $g(x) = \frac{x^2 - cx + d}{x^2 - 4}$.

a. If $\lim_{x \rightarrow 3} f(x) = 6$, find a relationship between a and b .

b. If, in addition, $\lim_{x \rightarrow 1} f(x) = 1$, find the values of a and b .

c. Find $\lim_{x \rightarrow -\infty} f(x)$.

d. If $\lim_{x \rightarrow 2} g(x) = 3$, find c and d .