1. Let \( f(x) = \frac{x^2 - 5x + 6}{x^2 - 3x} \).

(a) Find \( f(3) \).

(b) Find \( \lim_{x \to 3} f(x) \).

Solution:

(a) We get \( 0/0 \), so \( f(3) \) is undefined.

(b) We have

\[
\lim_{x \to 3} f(x) = \lim_{x \to 3} \frac{(x - 3)(x - 2)}{x(x - 3)}
= \lim_{x \to 3} \frac{x - 2}{x}
= \frac{1}{3}.
\]

2. Find \( \lim_{x \to 4^+} \frac{x(x - 5)}{x^2(x - 4)} \).

Solution: We have

\[
\lim_{x \to 4^+} \frac{x(x - 5)}{x^2(x - 4)} = \frac{4(-1)}{16(0^+)}
\]

which indicates that the limit is \(-\infty\).

3. Let \( f(x) = \begin{cases} 2x - 1 & \text{if } x < 2 \\ 6 - x^2 & \text{if } x \geq 2 \end{cases} \). Find \( \lim_{x \to 2^-} f(x) \).

Since \( f(x) = 2x - 1 \) for \( x < 2 \), we have that

\[
\lim_{x \to 2^-} f(x) = \lim_{x \to 2^-} 2x - 1 = 3.
\]