

## 1 Limits

### 1.1 Example

1. Compute  $\lim_{x \rightarrow -\infty} \frac{x+3}{\sqrt{9x^2-5x}}$ .

### 1.2 Problems

2. Compute  $\lim_{x \rightarrow \infty} \frac{(2x+5)(x-2)}{(7x-2)(3x+1)}$ .
3. None of the following functions are defined at  $x = 3$ . Is there a way to define each function at  $x = 3$  so that it's still continuous?

(a)  $f(x) = \frac{x^2-9}{x-3}$

(b)  $g(x) = \frac{x^2+3x-9}{x-3}$

(c)  $h(x) = \frac{x^2-7x+6}{x-3}$

4. Compute  $\lim_{x \rightarrow \infty} \frac{2-\cos(x)}{3-2x}$ .

5. Find  $\lim_{x \rightarrow 2} \frac{x^2 - 4}{\sqrt{x} - \sqrt{4-x}}$ .

## 2 Vertical Asymptotes

### 2.1 Example

6. Find  $\lim_{x \rightarrow 0^-} x^{-1}e^{x^{-2}}$ .

### 2.2 Problems

7. Find  $\lim_{x \rightarrow 2\pi^-} x \csc(x)$ .

8. Find  $\lim_{x \rightarrow 2^-} \frac{x^2 - 2x - 8}{-(x^2 - 5x + 6)}$ .

9. Find  $\lim_{x \rightarrow 3^+} \frac{\sqrt{x}}{(x-3)^4}$ .

### 2.3 Extra Problems

10. Find  $\lim_{x \rightarrow 2\pi^+} x \csc(x)$ .

11. Find  $\lim_{x \rightarrow 2^+} \frac{x^2 - 2x - 8}{-(x^2 - 5x + 6)}$ .

12. Find  $\lim_{x \rightarrow 3^-} \frac{\sqrt{x}}{(x - 3)^4}$ .