

## Oefening limieten 7 ANTWOORDEN

$$1. \quad \lim_{x \rightarrow 3} \frac{5x^2 - 8x - 13}{x^2 - 5} = \frac{8}{4} = 2$$

$$2. \quad \lim_{n \rightarrow \infty} \frac{n+3}{\sqrt{9n^2 - 5n}} = \lim_{n \rightarrow \infty} \frac{1 + \frac{3}{n}}{\sqrt{9 - \frac{5}{n}}} = \frac{1}{3}$$

$$3. \quad \lim_{n \rightarrow \infty} x - \sqrt{x^2 + 7} = \lim_{n \rightarrow \infty} (x - \sqrt{x^2 + 7}) \cdot \frac{x + \sqrt{x^2 + 7}}{x + \sqrt{x^2 + 7}} = \lim_{n \rightarrow \infty} \frac{-7}{x + \sqrt{x^2 + 7}} = 0$$

$$4. \quad \lim_{x \rightarrow -\infty} \frac{x+7}{3x+5} = \lim_{x \rightarrow -\infty} \frac{1 + \frac{7}{x}}{3 + \frac{5}{x}} = \frac{1}{3}$$

5.

$$\lim_{n \rightarrow 4} \frac{3 - \sqrt{n+5}}{n-4} = \lim_{n \rightarrow 4} \frac{3 - \sqrt{n+5}}{n-4} \cdot \frac{3 + \sqrt{n+5}}{3 + \sqrt{n+5}} = \lim_{n \rightarrow 4} \frac{4-n}{(n-4)(3 + \sqrt{n+5})} = \lim_{n \rightarrow 4} \frac{-1}{3 + \sqrt{n+5}} = -\frac{1}{6}$$

$$6. \quad \lim_{x \rightarrow 2} \frac{3x^2 - x - 10}{x^2 - 4} = \lim_{x \rightarrow 2} \frac{(x-2)(3x+5)}{(x-2)(x+2)} = \lim_{x \rightarrow 2} \frac{3x+5}{x+2} = \frac{11}{4}$$

$$7. \quad \lim_{x \rightarrow -\infty} x - \sqrt{x^2 + 7} = \lim_{x \rightarrow -\infty} (x - \sqrt{x^2 + 7}) \cdot \frac{x + \sqrt{x^2 + 7}}{x + \sqrt{x^2 + 7}} = \lim_{x \rightarrow -\infty} \frac{-7}{x + \sqrt{x^2 + 7}} = 0$$

$$8. \quad \lim_{x \rightarrow 2} \frac{\frac{1}{x} - \frac{1}{2}}{x^3 - 8} = \lim_{x \rightarrow 2} \frac{\frac{2-x}{2x}}{x^3 - 8} = \lim_{x \rightarrow 2} \frac{2-x}{2x(x^3 - 8)} = \lim_{x \rightarrow 2} \frac{-1(x-2)}{2x(x-2)(x^2 + 2x + 4)} = \lim_{x \rightarrow 2} \frac{-1}{2x(x^2 + 2x + 4)} = \frac{-1}{48}$$

$$9. \quad \lim_{n \rightarrow 1} \frac{n^3 - 1}{(n-1)} = \lim_{n \rightarrow 1} \frac{(n-1)(n^2 + n + 1)}{(n-1)} = \lim_{n \rightarrow 1} n^2 + n + 1 = 3$$

$$10. \quad \lim_{x \rightarrow 27} \frac{x-27}{x^{\frac{1}{3}} - 3} = \lim_{x \rightarrow 27} \frac{(x^{\frac{1}{3}} - 3)(x^{\frac{2}{3}} + \frac{1}{3}x + 9)}{x^{\frac{1}{3}} - 3} = \lim_{x \rightarrow 27} x^{\frac{2}{3}} + \frac{1}{3}x + 9 = 27$$