

$$\lim_{x \rightarrow 3} \frac{\sqrt{x+6} - \sqrt{10x-21}}{5x-15}$$

$$\begin{aligned} \lim_{x \rightarrow 3} & [(V(x+6) - V(10x-21)) \cdot (V(x+6) + V(10x-21))] / ((5x-15)(V(x+6) + V(10x-21))) = \\ & ((x+6) - (10x-21)) / ((5x-15)(V(x+6) + V(10x-21))) = (-9x+27) / ((5x-15)(V(x+6) + V(10x-21))) = \\ & (-9(x-3)) / (5(x-3)(V(x+6) + V(10x-21))) = -9/5(V(x+6) + V(10x-21)) = -9/30 = -0.3 \end{aligned}$$

$$\lim_{x \rightarrow -2} \frac{x^2 + x - 2}{\sqrt{x+6} - 2}$$

$$\begin{aligned} (x+2)(x-1)(V(x+6)+2) / (V(x+6)+2)(V(x+6)-2) = \\ (x+2)(x-1)(V(x+6)+2) / (x+2) = \\ (x-1)(V(x+6)+2) = -3 \cdot 4 = -12 \end{aligned}$$

$$\begin{array}{r|l} x^3 - 0 \cdot x^2 - 2x + 1 & | x-1 \\ x^3 - x^2 & | x^2 + x - 1 \\ \hline x^2 - 2x & \\ x^2 - x & \\ \hline -x + 1 & \\ -x + 1 & \\ \hline 0 & \end{array}$$

$$1. \quad F(x) = \frac{2x^2 + x - 3}{x^3 - 2x + 1}, \quad a = 1;$$

$$2. \quad F(x) = \frac{\sqrt{x+21} - 5\sqrt{x-3}}{x^3 - 64}, \quad a = 4;$$

$$F(x) = \sqrt{x^2 + x + 1} - \sqrt{x^3 - x + 1}, \quad a = +\infty.$$

$$1) \quad 2(x-1)(x+1.5) / (x-1)(x^2+x-1) = 2(x+1.5) / (x^2+x-1) = 5$$

$$D=25$$

$$x_1 = -1 + 5/4 = 1$$

$$x_2 = -1 - 5/4 = -6/4 = -3/2 = -1.5$$

$$\begin{aligned} 2) \quad & (V(x+21) - 5V(x-3))(V(x+21) + \\ & 5V(x-3)) / (x^3 - 64)(V(x+21) + 5V(x-3)) = \\ & = ((x+21) - 25(x-3)) / (x^3 - 64)(V(x+21) + 5V(x-3)) = \end{aligned}$$

$$\begin{aligned} & (-24x + 96) / (x^3 - 64)(V(x+21) + 5V(x-3)) = \\ & = 0/0 \end{aligned}$$

$$\begin{aligned} & (-24(x-4)) / (x-4)(x^2 + 4x + 16)(V(x+21) + 5V(x-3)) = \\ & -24 / (x^2 + 4x + 16)(V(x+21) + 5V(x-3)) = -24 / (48 \cdot (5+5)) = -1/20 \end{aligned}$$