(01) $\lim_{x \to -3^+} \dfrac{x+2}{x+3} \rightsquigarrow \left(\lim_{x \to -3^+} x+2\right) \cdot \left(\lim_{x \to -3^+} \dfrac{1}{x+3}\right)$

$$-1 \cdot \frac{1}{0^+ + 3} = -\infty$$

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(2) $\lim_{x \to -3^-} \dfrac{x+2}{x+3} \rightsquigarrow \left(\lim_{x \to -3^-} x+2\right) \cdot \left(\lim_{x \to -3^-} \dfrac{1}{x+3}\right)$

$$(-1) \cdot \frac{1}{0^- + 3} = +\infty$$

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(3) $\lim_{x \to 3^+} \dfrac{\sqrt{x^2-9}}{x-3} \rightsquigarrow \lim_{x \to 3^+} \sqrt{x^2-9} \cdot \lim_{x \to 3^+} \dfrac{1}{x-3}$

$$(\sqrt{0^+}) \cdot \left(\frac{1}{0^+}\right) = +\infty$$

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4) $\lim_{x \to 2^-} \dfrac{x^2-2x}{x^2-4x+4} \rightsquigarrow \dfrac{x\cancel{(x-2)}}{\cancel{(x-2)}(x+2)} \rightsquigarrow \dfrac{x}{\underbrace{x+2}_{-\infty}} = \dfrac{2}{-\infty} = -\infty$

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5) $\lim_{y \to +\infty} \dfrac{2-3y^2}{5y^2+4y} \rightsquigarrow \lim_{y \to +\infty} \cancel{\dfrac{2}{5y^2+4y}} \cdot \lim_{y \to +\infty} -\dfrac{3 \cdot \cancel{y^2}}{\cancel{y^2}(5+\frac{4}{y})}$

$$-\frac{3}{5+\cancel{\frac{4}{y}}^{\,0}} \rightsquigarrow \boxed{-\frac{3}{5}}$$

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6) $\lim_{t \to +\infty} \dfrac{\sqrt{t}+t^2}{2t-t^2} \rightsquigarrow \dfrac{\sqrt{t}}{2t-t^2} + \dfrac{t^2}{2t-t^2} \rightsquigarrow \lim_{t \to +\infty} \cancel{\dfrac{\sqrt{t}}{2t-t^2}} \cdot \lim_{t \to +\infty} \dfrac{t^2}{2t-t^2}$

$$\lim_{t \to +\infty} \frac{\cancel{t^2}}{\cancel{t^2}(\frac{2}{t}-1)} \rightsquigarrow \frac{1}{(\cancel{\frac{2}{t}}-1)} = \boxed{-1}$$

07) $\lim_{x\to+\infty} \frac{\sqrt{4x^2-x}}{x+1} \cdot \frac{\sqrt{4x^2-x}}{\sqrt{4x^2-x}} \leadsto \frac{4x^2-x}{(x+1)(\sqrt{4x^2-x})} \leadsto \frac{\cancel{x^2}(4-\frac{1}{x})}{\cancel{x}(1+\frac{1}{x})(\cancel{x}\sqrt{4-\frac{1}{x}})}$

$\frac{4-\cancel{\frac{1}{x}}}{(1+\cancel{\frac{1}{x}})\cdot(\sqrt{4-\cancel{\frac{1}{x}}})} \leadsto \frac{4}{2} = \boxed{2}$

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8) $\lim_{x\to\infty} \frac{\sqrt{4x^2-x}}{x+1} \cdot \frac{\sqrt{4x^2-x}}{\sqrt{4x^2-x}} \leadsto \frac{4x^2-x}{(x+1)(\sqrt{4x^2-x})} \leadsto \frac{x^2(4-\frac{1}{x})}{x(1+\frac{1}{x})(x\sqrt{4-\frac{1}{x}})}$

$\frac{4-\cancel{\frac{1}{x}}}{(1+\cancel{\frac{1}{x}})(\sqrt{4-\cancel{\frac{1}{x}}})} \leadsto \frac{4}{2} = \boxed{2}$

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9) $y = \frac{2x+1}{x-2} \leadsto \frac{\cancel{x}(2+\frac{1}{x})}{\cancel{x}(1-\frac{2}{x})} \leadsto \frac{2+\frac{1}{x}}{1-\frac{2}{x}}$

$\lim_{x\to\infty^+} \frac{2+\cancel{\frac{1}{x}}}{1-\cancel{\frac{2}{x}}} = \boxed{2}$ / $\lim_{x\to\infty^-} \frac{2+\cancel{\frac{1}{x}}}{1-\cancel{\frac{2}{x}}} = \boxed{2} \leadsto \boxed{y=2}$ Horizontal

$x-2=0$

$\boxed{x=2} \leadsto \lim_{x\to 2^-} \frac{2x+1}{x-2} \quad \frac{2x}{x-2} + \frac{1}{x-2} \leadsto \lim_{x\to 2^-} \frac{2x}{x-2} + \lim \frac{1}{x-2}$ $-\infty$ $-\infty$

$\lim_{x\to 2^-} \frac{2x+1}{x-2} = -\infty$

$\lim_{x\to 2^+} \frac{2x+1}{x-2} \leadsto \lim_{x\to 2^+} \frac{2x}{x-2} + \lim_{x\to 2^+} \frac{1}{x-2} = +\infty$ $+\infty$ $+\infty$

$\boxed{x=2}$ vertical

10) $y = \dfrac{3x^2+x-1}{x^2+x-2} \Rightarrow \dfrac{\cancel{x^2}\left(3+\frac{1}{x}-\frac{1}{x^2}\right)}{\cancel{x^2}\left(1+\frac{1}{x}-\frac{2}{x^2}\right)}$

$\lim\limits_{x\to+\infty} \dfrac{3+\cancel{\frac{1}{x}}-\cancel{\frac{1}{x^2}}}{1+\cancel{\frac{1}{x}}-\cancel{\frac{2}{x^2}}} = \dfrac{3}{1} = 3 \quad = \quad \lim\limits_{x\to-\infty} \dfrac{3+\cancel{\frac{1}{x}}-\cancel{\frac{1}{x^2}}}{1+\cancel{\frac{1}{x}}-\cancel{\frac{1}{x^2}}} = 3 \Rightarrow \boxed{y=3} \Rightarrow$ Horizontal

$x^2+x-2=0 \Rightarrow (x-1)(x+2)=0, \ x=1, \ x=-2$

$\lim\limits_{x\to1^-} \dfrac{3x^2+x-1}{x^2+x-2} \Rightarrow \dfrac{\lim\limits_{x\to1^-} 3x^2+x-1}{\lim\limits_{x\to1^-} \underbrace{(x-1)}_{0^-}\underbrace{(x+2)}_{3}} = \dfrac{3}{0^-} = -\infty$

$\lim\limits_{x\to1^+} \dfrac{3x^2+x-1}{x^2+x-2} \Rightarrow \dfrac{\lim\limits_{x\to1^+} 3x^2+x-1}{\lim\limits_{x\to1^+} \underbrace{(x-1)}_{0^+}\underbrace{(x+2)}_{3}} = \dfrac{3}{0^+} = +\infty$

$\Rightarrow \boxed{x=1}$ Vertical

$\lim\limits_{x\to-2^-} \dfrac{3x^2+x-1}{x^2+x-2} \Rightarrow \dfrac{\lim\limits_{x\to-2^-} 3x^2+x-1}{\lim\limits_{x\to-2^-} \underbrace{(x-1)}_{-3}\cdot\underbrace{(x+2)}_{0^-}} = \dfrac{9}{0^+} = +\infty$

$\lim\limits_{x\to-2^+} \dfrac{3x^2+x-1}{x^2+x-2} \Rightarrow \dfrac{\lim\limits_{x\to-2^+} 3x^2+x-1}{\lim\limits_{x\to-2^+} \underbrace{(x-1)}_{-3}\cdot\underbrace{(x+2)}_{0^+}} = \dfrac{9}{0^-} = -\infty$

$\Rightarrow \boxed{x=-2}$ Vertical