اسم ؟!

صفر

1

$$\lim_{x\to 1} \frac{2x^2-7x+3}{3x^2-4x+1} = \frac{(x-1)(2x-3)}{(x-1)(3x-1)} = \boxed{\frac{1}{2}}$$ ✓

2

$$\lim_{x\to 0} \frac{|3x-1|-|3x+1|}{x}$$

$0^+ \to = \frac{-(3x-1)-(3x+1)}{x} = \frac{-6x}{x} = \boxed{-6}$ ✓

$0^- \to = \frac{(3x-1)-(3x+1)}{x} = \frac{-6x}{x} = \boxed{-6}$

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3

$$\lim_{x\to 4} \frac{x-4}{\sqrt{x}-2} \Rightarrow \frac{(\sqrt{x}-2)(\sqrt{x}+2)}{(\sqrt{x}-2)} = \sqrt{x}+2 \Rightarrow = 2+2 = \boxed{4}$$ ✓

4

$$\lim_{x\to 2} \frac{x-\sqrt{2x}}{2x^2-x-6} \Rightarrow = \frac{\sqrt{x}(\sqrt{x}-\sqrt{2})}{(2x+3)(x-2)} = \frac{(\sqrt{x})(\sqrt{x}-\sqrt{2})}{(2x+3)(\sqrt{x}+\sqrt{2})(\sqrt{x}-\sqrt{2})} = \frac{\sqrt{x}}{(2x+3)(\sqrt{x}+\sqrt{2})} = \frac{\sqrt{2}}{7(2\sqrt{2})} = \boxed{\frac{1}{14}}$$ ✓

5

$$\lim_{x\to 1} \frac{1-\sqrt{x}}{2-\sqrt{3-x}} \Rightarrow = \frac{1-\sqrt{x}}{2-\sqrt{3-x}} \times \frac{2+\sqrt{3-x}}{2+\sqrt{3-x}} = \frac{(1-\sqrt{x})(2+\sqrt{3-x})}{4-3+x} = \frac{(1-\sqrt{x})(2+\sqrt{3-x})}{(\sqrt{x}+1)(\sqrt{x}-1)}$$

$$= \frac{2+\sqrt{3-x}}{-(\sqrt{x}+1)} = \frac{4}{-2} = \boxed{-2}$$ ✓

$$\lim_{x\to 2^+} \frac{\sqrt{x^2+5}-3}{\sqrt[3]{6x+1}-3} \Rightarrow = \frac{\sqrt{x^2+5}-3}{\sqrt[3]{6x+1}-3} \times \frac{\sqrt{x^2+5}+3}{\sqrt{x^2+5}+3} \times \frac{\sqrt[3]{(6x+1)^2}+9+3\sqrt[3]{6x+1}}{\sqrt[3]{(6x+1)^2}+9+3\sqrt[3]{6x+1}}$$

$$= \frac{x^2-4}{6x-18} = \frac{x-2}{6x-12} = \boxed{\frac{1}{6}}$$

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2hop $\rightarrow$ $$\lim_{x\to 2} \frac{\frac{3}{2\sqrt{x^2+5}}}{\frac{6}{3\sqrt[3]{(6x+1)^2}}} = \frac{\frac{3}{4}}{\frac{6}{27}} = \frac{81}{40}$$

$$\lim_{x\to 1} \frac{\sqrt{x^2+\sqrt{x}}-2}{\sqrt[3]{x}-1} \Leftrightarrow = \frac{\sqrt{x^2+\sqrt{x}}-2}{\sqrt[3]{x}-1} \times \frac{\sqrt[3]{x^2}+\sqrt[3]{x}+1}{\sqrt[3]{x^2}+\sqrt[3]{x}+1} \times \frac{\sqrt{x^2+\sqrt{x}}+2}{\sqrt{x^2+\sqrt{x}}+2} = \frac{(x^2+\sqrt{x}-4)(\sqrt[3]{x^2}+\sqrt[3]{x}+1)}{(\sqrt{x^2+\sqrt{x}}+2)(x-1)} \times \frac{(x^2-4)-\sqrt{x}}{(x^2-4)+\sqrt{x}}$$

$$= \frac{(9x^2+14-24x-x)(\sqrt[3]{x^2}+\sqrt[3]{x}+1)}{(\sqrt{x^2+\sqrt{x}}+2)(x-1)} \frac{(13x+1)(9x-14)}{(9x^2-126x+14)(\sqrt[3]{x^2}+\sqrt[3]{x}+1)} = \frac{(\sqrt{x}-1)(x+4)}{(\sqrt{x^2+\sqrt{x}}+2)(x-1)}$$

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$$= \frac{(-7)(13)}{2} = \frac{\sqrt{x^2+\sqrt{x}}-2}{\sqrt[3]{x}-1} \times \frac{\sqrt[3]{x^2}+\sqrt[3]{x}+1}{\sqrt[3]{x^2}+\sqrt[3]{x}+1} \times \frac{\sqrt{x^2+\sqrt{x}}+2}{\sqrt{x^2+\sqrt{x}}+2} = \frac{(\sqrt{x}+4)(\sqrt[3]{x^2}+\sqrt[3]{x}+1)}{(\sqrt{x}+1)(\sqrt{x^2+\sqrt{x}}+2)} = \boxed{\frac{21}{8}}$$

$$\lim_{x\to\pi} \frac{1+\cos^3 x}{\sin^2 x} \Rightarrow = \frac{1+\cos^3 x}{\sin^2 x} = \frac{(1+\cos x)(\cos^2 x+1-\cos x)}{(1-\cos x)(1+\cos x)} = \frac{1+1+1}{2} = \boxed{\frac{3}{2}}$$

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$$\lim_{x\to\frac{\pi}{4}} \frac{1-\tan x}{\sin x-\cos x} \Rightarrow = \frac{1-\frac{\sin x}{\cos x}}{\sin x-\cos x} = \frac{\frac{\cos x-\sin x}{\cos x}}{\frac{\sin x-\cos x}{1}} = -\frac{1}{\cos x} = \boxed{-\sqrt{2}}$$

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$$\lim_{x\to\frac{3\pi}{4}} \frac{\tan^2 x-1}{\cos 2x} \Rightarrow = \frac{\frac{\sin^2 x}{\cos^2 x}-1}{\cos^2 x-\sin^2 x} = \frac{\frac{\sin^2 x-\cos^2 x}{\cos^2 x}}{\frac{\cos^2 x-\sin^2 x}{1}} = -\frac{1}{\cos^2 x} = \boxed{-2}$$

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