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1) a) $\lim_{x \to 1} g(x)$ $\quad \lim_{x \to 1^-} g(x) = 1 \neq \lim_{x \to 1^+} g(x) = 0 \nexists \lim_{x \to 1} g(x)$

b) $\lim_{x \to 2} g(x) = 1$

c) $\lim_{x \to 3} g(x) = 0$

d) $\lim_{x \to 2,5} g(x) = 0,5$

2) a) $\lim_{x \to -2} f(x) = 0$

b) $\lim_{x \to -1} f(x) = -1$

c) $\lim_{x \to 0} f(x) \nexists \quad \lim_{x \to 0^-} f(x) = -1 \neq \lim_{x \to 0^+} f(x) = 1$

d) $\lim_{x \to -0,5} f(x) = -1$

14) $\lim_{x \to -2} (x^3 - 2x^2 + 4x + 8)$ $\quad \lim (-2^3 - 2(-2)^2 + 4(-2) + 8) = -16$

15) $\lim_{x \to 2} \dfrac{x+3}{x+6} = \dfrac{5}{8}$

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22) $\lim_{h \to 0} \frac{\sqrt{5h+4}-2}{h}$

$\lim_{h \to 0} \frac{\sqrt{5h+4}-2}{h} \cdot \frac{\sqrt{5h+4}+2}{\sqrt{5h+4}+2} = \frac{\sqrt{5h+4}^2-2^2}{h(\sqrt{5h+4}+2} = \frac{5h+4-2^2}{h(\sqrt{5h+4}+2)}$

$= \frac{5h}{h(\sqrt{5h+4}+2} = \frac{5}{\sqrt{5h+4}+2}$

$\lim_{h \to 0} \frac{5}{\sqrt{5h+4}+2} \Rightarrow \frac{5}{\sqrt{5.0+4}+2} = \frac{5}{\sqrt{4}+2} = \frac{5}{4}$

23) $\lim_{x \to 5} \frac{x-5}{x^2-25} \Rightarrow \frac{x-5}{x^2-5^2} = \frac{x-5}{(x+5)(x-5)} = \frac{1}{x+5}$

$\lim_{x \to 5} \frac{1}{x+5} \Rightarrow \frac{1}{5+5} = \frac{1}{10}$

24) $\lim_{x \to -3} \frac{x+3}{x^2+4x+3} \Rightarrow \frac{x+3}{(x-x_1).(x-x_2)} \Rightarrow \frac{x+3}{(x-(-1)).(x-(-3))} =$

$\underline{-3} + \underline{-1} = -4$

$\underline{-3} \cdot \underline{-1} = 3$

$= \frac{x+3}{(x+1).(x+3)} = \frac{1}{x+1}$

$\lim_{x \to -3} \frac{1}{x+1} = \frac{1}{-3+1} = \frac{1}{-2}$

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33) $\lim\limits_{U \to 1} \dfrac{U^4-1}{U^3-1} = \dfrac{(U^2+1)\cdot(U^2-1)}{(U-1)\cdot(U^2+U+1^2)} = \dfrac{(U^2+1)\cdot(U-1)\cdot(U+1)}{(U-1)\cdot(U^2+U+1)}$

$= \dfrac{(U^2+1)\cdot(U+1)}{(U^2+U+1)}$

$\lim\limits_{U \to 1} \dfrac{(U^2+1)\cdot(U+1)}{(U^2+U+1)} = \dfrac{(1^2+1)\cdot(1+1)}{(1^2+1+1)} = \dfrac{4}{3}$

34) $\lim\limits_{U \to 2} \dfrac{U^3-8}{U^4-16} = \dfrac{(U-2)\cdot(U^2+2U+2^2)}{(U^2+2^2)\cdot(U^2-2^2)} = \dfrac{(U-2)\cdot(U^2+2U+2^2)}{(U^2+2^2)\cdot(U-2)\cdot(U+2)}$

$= \dfrac{U^2+2U+2^2}{(U^2+2^2)\cdot(U+2)}$

$\lim\limits_{U \to 2} \dfrac{U^2+2U+2^2}{(U^2+2^2)\cdot(U+2)} = \dfrac{2^2+2.2+2^2}{(2^2+2^2)\cdot(2+2)} = \dfrac{12}{8\cdot4} = \dfrac{3}{8}$

38) $\lim\limits_{x \to -1} \dfrac{\sqrt{x^2+8}-3}{x+1} \to \dfrac{\sqrt{x^2+8}-3}{x+1} \cdot \dfrac{\sqrt{x^2+8}+3}{\sqrt{x^2+8}+3} = \dfrac{\sqrt{x^2+8}^2-3^2}{(x+1)\cdot(\sqrt{x^2+8}+3}$

$= \dfrac{x^2+8-9}{(x+1)\cdot(\sqrt{x^2+8}+3} = \dfrac{x^2-1}{(x+1)\cdot(\sqrt{x^2+8}+3} \Rightarrow \dfrac{(x+1)\cdot(x-1)}{(x+1)\cdot(\sqrt{x^2+8}+3}$

$= \dfrac{x-1}{\sqrt{x^2+8}+3}$ //

$\lim\limits_{x \to -1} \dfrac{x-1}{\sqrt{x^2+8}+3} = \dfrac{-1-1}{\sqrt{(-1)^2+8}+3} = \dfrac{-2}{\sqrt{9}+3} = \dfrac{-2}{3+3} = \dfrac{-2}{6} = \dfrac{-1}{3}$

39) $\lim_{x \to 2} \dfrac{\sqrt{x^2+12}-4}{x-2} \Rightarrow \dfrac{\sqrt{x^2+12}-4}{x-2} \cdot \dfrac{\sqrt{x^2+12}+4}{\sqrt{x^2+12}+4} = \dfrac{\sqrt{x^2+12}^2-4^2}{(x-2)\cdot(\sqrt{x^2+12}+4}$

$= \dfrac{x^2+12-16}{(x-2)\cdot(\sqrt{x^2+12}+4)} \Rightarrow \dfrac{x^2-2^2}{(x-2)\cdot(\sqrt{x^2+12}+4)} = \dfrac{(x-2)\cdot(x+2)}{(x-2)\cdot(\sqrt{x^2+12}+4)} =$

$= \dfrac{x+2}{\sqrt{x^2+12}+4}$,,

$\lim_{x \to 2} \dfrac{x+2}{\sqrt{x^2+12}+4} \Rightarrow \dfrac{2+2}{\sqrt{2^2+12}+4} = \dfrac{4}{4+4} = \dfrac{4}{8} = \dfrac{1}{2}$

47) $\lim_{x \to 0} \dfrac{1+x+\operatorname{sen} x}{3 \cdot \cos x} \Rightarrow \dfrac{1+0+\operatorname{sen} 0}{3\cos 0} = \dfrac{1+0+0}{3 \cdot 1} = \dfrac{1}{3}$,,

48) $\lim_{x \to 0} (x^2-1)(2-\cos x) \Rightarrow (0^2-1)\cdot(2-1) = -1 \cdot 1 = -1$,,

50) $\lim_{x \to 0} \sqrt{7x \sec^2 x} = \sqrt{7\left(\frac{1}{\cos x}\right)^2} = \sqrt{7\left(\frac{1}{1}\right)^2} = \sqrt{8} = 2\sqrt{2}$,,