p95 13, 21, 23, 25, 29, 31, 33, 42, 43, 65, 63, 81, 79, 85

Find the limit

(13) $\lim_{t\to 4} \sqrt{t+2} = \sqrt{4+2} = \sqrt{6}$

(21) $\lim_{x\to 4} \frac{(\sqrt{x-3}-1)(\sqrt{x-3}+1)}{(x-4)(\sqrt{x-3}+1)}$

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

(23) $\lim_{x\to 0} \frac{\frac{1}{x+1}-1}{x}$

$\lim_{x\to 0} \left(\frac{1}{x}\right)\left(\frac{1-(x+1)}{x+1}\right)$

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

(25) $\lim_{x\to 0} \frac{(1-\cos x)(1+\cos x)}{(\sin x)(1+\cos x)}$

$\lim_{x\to 0} \frac{(1-\cos^2 x)}{(\sin x)(1+\cos x)}$

$\lim_{x\to 0} \frac{\sin^2 x}{\sin x} \frac{1}{1+\cos x}$

$\lim_{x\to} \frac{\sin x}{1+\cos x} = \frac{0}{1+1} = 0$

For $\neq 2$, 9, 3 we have

$\lim_{x\to c} f(x) = -6$

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

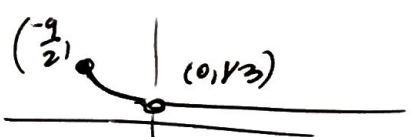
(29) $\lim_{x\to c} f(x)g(x) = (-6)\left(\frac{1}{2}\right) = -3$

(31) $\lim_{x\to c} f(x) + 2g(x)$

$-6 + 2\left(\frac{1}{2}\right) = -5$

(33) use graph & table

$\lim_{x\to 0} \frac{\sqrt{2x+9}-3}{x} = \frac{1}{3}$



x	-.1	-.01	-.001	0	.001	.01	.1
f(x)	.335	.3335	.33333	?	.33333	.3335	.335

p96 (42) $\lim_{x\to 3^-} \frac{|x-3|}{x-3} = \lim_{x\to 3^-} \frac{-(x-3)}{x-3} = \lim_{x\to 3^-} \frac{3-x}{x-3} = -1$

(43) $\lim_{x\to 2} f(x)$ where $f(x) = \begin{cases} (x-2)^2, & x \le 2 \\ 2-x, & x > 2 \end{cases}$

$\lim_{x\to 2^-} (x-2)^2 = 0$; $\lim_{x\to 2^+} 2-x = 0$ so $\lim_{x\to 2} f(x) = 0$

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p96 (62) $f(x) = \dfrac{4x^2+7x-2}{x+2} = \dfrac{(x+2)(4x-1)}{(x+2)}$

so a removable discontinuity at $x=-2$

(63) $f(x) = \sqrt{x} + \cos x \quad x \geq 0$ so $[0,\infty)$ is continuous

(65) $f(x) = \begin{cases} \dfrac{3x^2-x-2}{x-1}, & x \neq 1 \\ 0, & x = 1 \end{cases}$

$\lim\limits_{x\to 1} \dfrac{(x-1)(3x+2)}{(x-1)} = 5 \neq f(1) = 0$ so cont. all $\mathbb{R}$ but $x=1$

find the one sided limit

(79) $\lim\limits_{x\to 1^-} \dfrac{x^2+2x+1}{x-1} = \dfrac{4}{(1^2-1)} = -\infty$

smaller on left so <0

(81) $\lim\limits_{x\to -1^+} \dfrac{x+1}{x^3+1} = \lim\limits_{x\to -1^+} \dfrac{(x+1)}{(x+1)(x^2-x+1)} = \dfrac{1}{1-(-1)+1} = \dfrac{1}{3}$

(85) $\lim\limits_{x\to 0^+} \dfrac{\sin 4x}{5x} = \lim\limits_{x\to 0^+} \dfrac{4\sin 4x}{5\cdot 4x} = \lim\limits_{x\to 0^+} \left(\dfrac{\sin 4x}{4x}\right)\dfrac{4}{5} = \dfrac{4}{5}$