

AP Calculus - Section 1.3  
Solutions to even problems:

$$(28.) \lim_{x \rightarrow \pi} \tan x = \tan \pi = \boxed{0}$$

$$(30.) \lim_{x \rightarrow 1} \sin \frac{\pi x}{2} = \sin \frac{\pi}{2} = \boxed{1}$$

$$(32.) \lim_{x \rightarrow \pi} \cos 3x = \cos 3\pi = \boxed{-1}$$

$$(34.) \lim_{x \rightarrow \frac{5\pi}{3}} \cos x = \cos \frac{5\pi}{3} = \boxed{\frac{1}{2}}$$

$$(36.) \lim_{x \rightarrow 7} \sec \left( \frac{\pi x}{6} \right) = \sec \frac{7\pi}{6} = \frac{1}{\cos \frac{7\pi}{6}} = \frac{1}{-\frac{\sqrt{3}}{2}} = \boxed{-\frac{2}{\sqrt{3}} \text{ or } -\frac{2\sqrt{3}}{3}}$$

$$(50.) \lim_{x \rightarrow 2} \frac{2-x}{x^2-4} = \lim_{x \rightarrow 2} \frac{-1(x-2)}{(x+2)(x-2)} = \lim_{x \rightarrow 2} \frac{-1}{x+2} = \frac{-1}{2+2} = \boxed{-\frac{1}{4}}$$

$$(52.) \lim_{x \rightarrow 4} \frac{x^2-5x+4}{x^2-2x-8} = \lim_{x \rightarrow 4} \frac{(x-4)(x-1)}{(x+4)(x-2)} = \lim_{x \rightarrow 4} \frac{x-1}{x+2} = \frac{4-1}{4+2} = \frac{3}{6} = \boxed{\frac{1}{2}}$$

$$(54.) \lim_{x \rightarrow 0} \frac{(\sqrt{2+x} - \sqrt{2}) \cdot (\sqrt{2+x} + \sqrt{2})}{x \cdot (\sqrt{2+x} + \sqrt{2})} = \lim_{x \rightarrow 0} \frac{2+x-2}{x(\sqrt{2+x} + \sqrt{2})} = \lim_{x \rightarrow 0} \frac{x}{x(\sqrt{2+x} + \sqrt{2})}$$
$$= \lim_{x \rightarrow 0} \frac{1}{\sqrt{2+x} + \sqrt{2}} = \frac{1}{\sqrt{2+0} + \sqrt{2}} = \boxed{\frac{1}{2\sqrt{2}} \text{ or } \frac{\sqrt{2}}{4}}$$

$$(56.) \lim_{x \rightarrow 3} \frac{(\sqrt{x+1} - 2) \cdot (\sqrt{x+1} + 2)}{(x-3) \cdot (\sqrt{x+1} + 2)} = \lim_{x \rightarrow 3} \frac{x+1-4}{(x-3)(\sqrt{x+1} + 2)}$$
$$= \lim_{x \rightarrow 3} \frac{x-3}{(x-3)(\sqrt{x+1} + 2)} = \lim_{x \rightarrow 3} \frac{1}{\sqrt{x+1} + 2} = \frac{1}{\sqrt{3+1} + 2} = \boxed{\frac{1}{4}}$$

# Ap Calculus Problems And Solutions

**Peipei Pang**



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