Solutions to some of the even numbered items

Pg 71

(#18) $\lim_{x \to 5} \frac{5}{x+3} = \frac{5}{(5)+3} = \boxed{\frac{5}{8}}$

Just substitute and simplify.

(#32) $\lim_{x \to \pi} \cos(3x) = \cos(3(\pi))$

$= \cos(3\pi)$

$= \boxed{-1}$

Ditto here

(#38) Given $\lim_{x \to c} f(x) = 2$ $\lim_{x \to c} g(x) = \frac{1}{4}$

(a) $\lim_{x \to c} [4f(x)] = 4 \cdot \lim_{x \to c} [f(x)]$ ← given

$= 4 \cdot 2$

$= 8$

(b) $\lim_{x \to c} [f(x) + g(x)] = \lim_{x \to c} f(x) + \lim_{x \to c} g(x)$ ← given: That is replace the limit expression with its given value.

$= 2 + \frac{1}{4}$

$= \boxed{\frac{9}{4}}$

(c) $\lim_{x \to c} [f(x) g(x)] = \lim_{x \to c} f(x) \cdot \lim_{x \to c} g(x)$ ← similar

$= (2) \cdot (\frac{1}{4})$

$= \boxed{\frac{1}{2}}$

(d) part d is done similarly.

(#52) $\lim_{x\to 2} \dfrac{x^2+2x-8}{x^2-x-2} = \lim_{x\to 2} \dfrac{(x+4)(x-2)}{(x-2)(x+1)}$

$= \lim_{x\to 2} \dfrac{(x+4)}{(x+1)}$

$= \dfrac{(2)+4}{(2)+1}$

$= \dfrac{6}{3} = \boxed{2}$

(56) $\lim_{x\to 0} \dfrac{\sqrt{2+x}-\sqrt{2}}{x} = \lim_{x\to 0} \dfrac{(\sqrt{2+x}-\sqrt{2})}{x} \cdot \dfrac{(\sqrt{2+x}+\sqrt{2})}{(\sqrt{2+x}+\sqrt{2})}$

$= \lim_{x\to 0} \dfrac{2+x-2}{x(\sqrt{2+x}+\sqrt{2})}$

$= \lim_{x\to 0} \dfrac{x}{x(\sqrt{2+x}+\sqrt{2})}$

$= \lim_{x\to 0} \dfrac{1}{(\sqrt{2+x}+\sqrt{2})}$

$= \dfrac{1}{\sqrt{2+0}+\sqrt{2}}$

$= \boxed{\dfrac{1}{2\sqrt{2}}}$

Regard "Δx" as if it were a single variable

(#60) $\lim_{\Delta x\to 0} \dfrac{(x+\Delta x)^2 - x^2}{\Delta x} = \lim_{\Delta x\to 0} \dfrac{x^2+2x\Delta x+\Delta x^2-x^2}{\Delta x}$ (FOIL)

$= \lim_{\Delta x\to 0} \dfrac{2x\Delta x+\Delta x^2}{\Delta x}$

Cont.

Cont: $= \lim_{\Delta x \to 0} \frac{\Delta x(2x + \Delta x)}{\Delta x}$ ← Factor out "Δx"

— Pg 3 here

$= \lim_{(\Delta x \to 0)} (2x + \Delta x)$ ← substitute 0 in for "Δx" NOT FOR x!

$= 2x + (0)$

$= \boxed{2x}$