

$$1. f(2) = 2(2)^3 - 5(2)^2 + 4 = 16 - 20 + 4 = 0$$

$$2. f(2) = \frac{4(2)^2 - 5}{(2)^3 + 4} = \frac{16 - 5}{8 + 4} = \frac{11}{12}$$

$$3. f(2) = \sin\left(\pi \cdot \frac{2}{2}\right) = \sin(\pi) = 0$$

$$4. f(2) = \frac{1}{(2)^2 - 1} = \frac{1}{3}$$

$$9. \frac{x^2 - 3x - 18}{x + 3} = \frac{(x + 3)(x - 6)}{x + 3}$$

$$= x - 6$$

$$10. \frac{2x^2 - x}{2x^2 + x - 1} = \frac{x(2x - 1)}{(2x - 1)(x + 1)}$$

$$= \frac{x}{x + 1}$$

$$2. y = 16t^2$$

$$\text{Avg speed} = \frac{\Delta y}{\Delta t} = \frac{16(4)^2 - 16(0)^2}{4 - 0} = 64 \text{ ft/s}$$

$$4. \text{ speed at } 4 \text{ sec: } \frac{\Delta y}{\Delta t} = \frac{16(4+h)^2 - 16(4)^2}{h} = \frac{16(16 + 8h + h^2) - 256}{h}$$

$$= \frac{256 + 128h + 16h^2 - 256}{h} = 128 + 16h$$

$$\text{As } h \rightarrow 0, \text{ speed} = 128 \text{ ft/s}$$

$$7. \lim_{x \rightarrow -\frac{1}{2}} 3x^2(2x - 1) = 3\left(-\frac{1}{2}\right)^2\left(2\left(-\frac{1}{2}\right) - 1\right) = \boxed{\frac{-3}{8}}$$

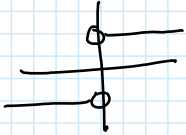
$$11. \lim_{y \rightarrow -3} \frac{y^2 + 4y + 3}{y^2 - 3} = \frac{\lim_{y \rightarrow -3} (y^2 + 4y + 3)}{\lim_{y \rightarrow -3} (y^2 - 3)} = \frac{f(-3)}{g(-3)} = \frac{9 + 4(-3) + 3}{9 - 3} = \frac{0}{6} = \boxed{0}$$

$$13. \lim_{x \rightarrow -2} (x - 6)^{\frac{2}{3}} = \left[ \lim_{x \rightarrow -2} (x - 6) \right]^{\frac{2}{3}} = [-8]^{\frac{2}{3}} = \boxed{4}$$

$$15. \text{ use calculator table! } f(x) = \frac{x^2 + 6x + 2}{x + 1} \quad \lim_{x \rightarrow 0} f(x) = \boxed{2}$$

$$17. f(x) = x \sin \frac{1}{x} \quad \lim_{x \rightarrow 0} f(x) = 0$$

$$23. \lim_{x \rightarrow 0} \frac{|x|}{x} = \text{D.N.E.}$$



$$26. \lim_{t \rightarrow 2} \frac{t^2 - 3t + 2}{t^2 - 4} = \lim_{t \rightarrow 2} \frac{(t-2)(t-1)}{(t-2)(t+2)} = \lim_{t \rightarrow 2} \frac{t-1}{t+2} = \frac{2-1}{2+2} = \frac{1}{4}$$

$$43. a) \lim_{x \rightarrow -1^+} f(x) = 1 \quad \text{True}$$

$$b) \lim_{x \rightarrow 0^-} f(x) = 0 \quad \text{True}$$

$$c) \lim_{x \rightarrow 0^-} f(x) = 1 \quad \text{False}$$

$$d) \lim_{x \rightarrow 0^-} f(x) = \lim_{x \rightarrow 0^+} f(x) \quad \text{True}$$

$$e) \lim_{x \rightarrow 0} f(x) \text{ exists} \quad \text{True}$$

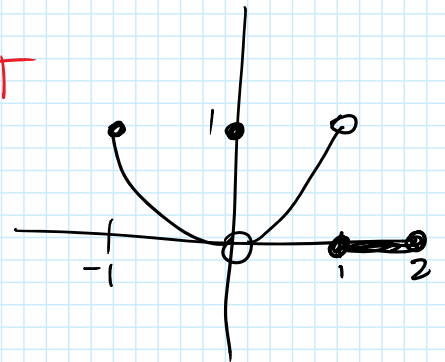
$$f) \lim_{x \rightarrow 0} f(x) = 0 \quad \text{True}$$

$$g) \lim_{x \rightarrow 0} f(x) = 1 \quad \text{False}$$

$$h) \lim_{x \rightarrow 1} f(x) = 1 \quad \text{False}$$

$$i) \lim_{x \rightarrow 1} f(x) = 0 \quad \text{False}$$

$$j) \lim_{x \rightarrow 2^-} f(x) = 2 \quad \text{False}$$

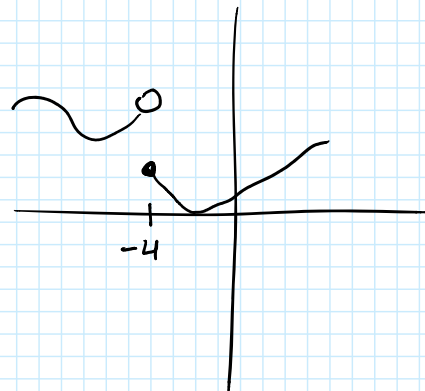


$$46. a) \lim_{t \rightarrow -4^-} g(t) = 5$$

$$b) \lim_{t \rightarrow -4^+} g(t) = 2$$

$$c) \lim_{t \rightarrow -4} g(t) = \text{DNE}$$

$$d) g(-4) = 2$$

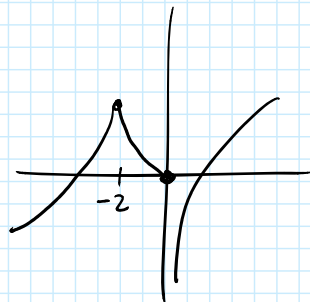


$$48. a) \lim_{s \rightarrow -2^-} p(s) = 3$$

$$b) \lim_{s \rightarrow -2^+} p(s) = 3$$

$$c) \lim_{s \rightarrow -2} p(s) = 3$$

$$d) p(-2) = 3$$



50. a)  $\lim_{x \rightarrow 2^-} G(x) = 1$

b)  $\lim_{x \rightarrow 2^+} G(x) = 1$

c)  $\lim_{x \rightarrow 2} G(x) = 1$

d)  $G(2) = 3$

