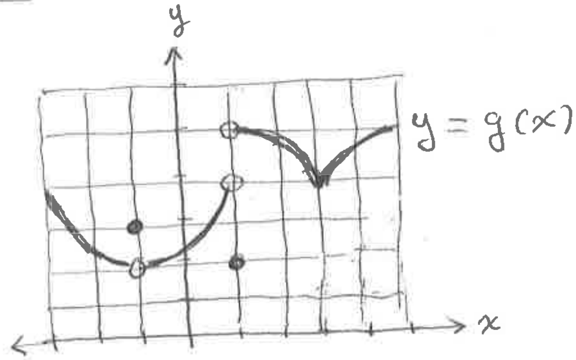
Math 200

Briggs & Cochran § 2.2



(24) ⓐ $g(-1) = 3$

ⓑ $\lim_{x \to 1^-} g(x) = 2$

ⓒ $\lim_{x \to 1^+} g(x) = 2$

ⓓ $\lim_{x \to -1} g(x) = 2$

ⓔ $g(1) = 2$

ⓕ $\lim_{x \to 1} g(x)$ DNE

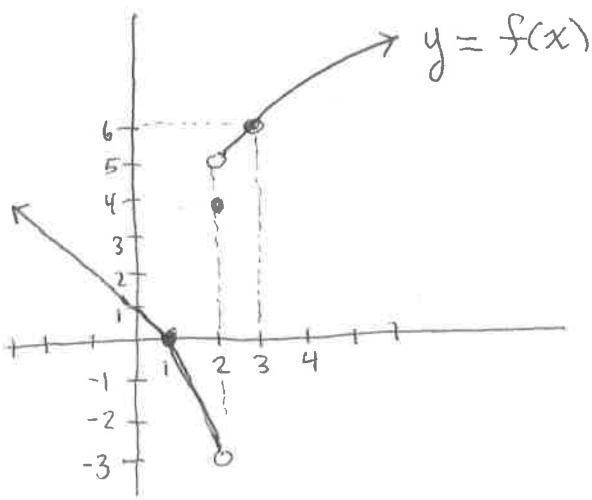
ⓖ $\lim_{x \to 3} g(x) = 4$

ⓗ $g(5) = 5$

ⓘ $\lim_{x \to 5^-} g(x) = 5$

(28) Sketch the graph of a function that meets the following conditions.

$f(1) = 0$ $\quad f(2) = 4$ $\quad f(3) = 6$ $\quad \lim_{x \to 2^-} f(x) = -3$ $\quad \lim_{x \to 2^+} f(x) = 5$



§ 2.3

(20) If $\lim_{x\to 1} f(x) = 8$ and $\lim_{x\to 1} g(x) = 3$ then

$$\lim_{x\to 1} f(x)g(x) = \left(\lim_{x\to 1} f(x)\right)\left(\lim_{x\to 1} g(x)\right) = 8\cdot 3 = \boxed{24}$$

(26) $$\lim_{x\to -2} (t^2+5t+7) = (-2)^2+5(-2)+7 = \boxed{1}$$

(32) $$\lim_{h\to 0} \frac{3}{\sqrt{16+3h}+4} = \frac{\lim_{h\to 0} 3}{\lim_{h\to 0}\left(\sqrt{16+3h}+4\right)} = \frac{3}{\sqrt{16+0}+4} = \boxed{\frac{3}{8}}$$

(40) $$\lim_{x\to 3} \frac{x^2-2x-3}{x-3} = \lim_{x\to 3} \frac{(x+1)\cancel{(x-3)}}{\cancel{x-3}} = \lim_{x\to 3}(x+1) = \boxed{4}$$

(46) $$\lim_{h\to 0} \frac{\frac{1}{5+h}-\frac{1}{5}}{h} = \lim_{h\to 0} \frac{\frac{5}{(5+h)5}-\frac{5+h}{(5+h)5}}{h}$$

$$= \lim_{h\to 0} \frac{\frac{5-(5+h)}{(5+h)5}}{h} = \lim_{h\to 0} \frac{\frac{-h}{(5+h)5}}{\frac{h}{1}} = \lim_{h\to 0} \frac{-h}{(5+h)5}\frac{1}{h}$$

$$= \lim_{h\to 0} \frac{-1}{(5+h)5} = \frac{-1}{(5+0)5} = \boxed{-\frac{1}{25}}$$

(50) $$\lim_{x\to a} \frac{x^2-a^2}{\sqrt{x}-\sqrt{a}} = \lim_{x\to a} \frac{(x-a)(x+a)}{\sqrt{x}-\sqrt{a}}$$

$$= \lim_{x\to a} \frac{(x-a)(x+a)}{\sqrt{x}-\sqrt{a}}\,\frac{\sqrt{x}+\sqrt{a}}{\sqrt{x}+\sqrt{a}}$$

$$= \lim_{x\to a} \frac{\cancel{(x-a)}(x+a)(\sqrt{x}+\sqrt{a})}{\cancel{x-a}} = \lim_{x\to a}(x+a)(\sqrt{x}+\sqrt{a})$$

$$= (a+a)(\sqrt{a}+\sqrt{a}) = 2a\,2\sqrt{a} = \boxed{4a\sqrt{a}}$$