

$$1. \lim_{x \rightarrow 9} \frac{\sqrt{x}-3}{x-9} = \lim_{x \rightarrow 9} \frac{\sqrt{x}-3}{x-9} \frac{\sqrt{x}+3}{\sqrt{x}+3} = \lim_{x \rightarrow 9} \frac{x-9}{(x-9)(\sqrt{x}+3)} = \lim_{x \rightarrow 9} \frac{1}{\sqrt{x}+3}$$

$$= \frac{1}{\sqrt{9}+3} = \boxed{\frac{1}{6}}$$

2. Answer the following questions about the function $y = f(x)$ graphed below.

(a) $f(1) = \boxed{-3}$

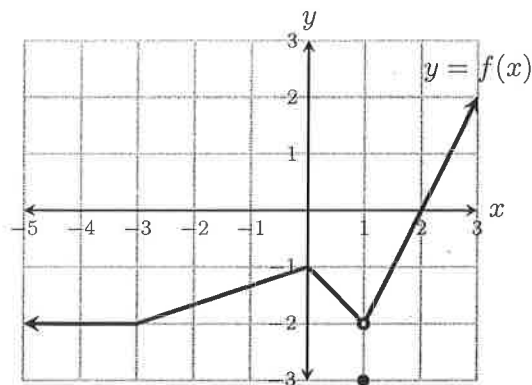
(b) $\lim_{x \rightarrow 1} f(x) = \boxed{-2}$

(c) $\lim_{x \rightarrow 1} f(2x) = f(2 \cdot 1) = f(2) = \boxed{0}$

(d) $f \circ f(2) = f(f(2)) = f(0) = \boxed{-1}$

(e) $\lim_{x \rightarrow -3} f(x) = \boxed{-2}$

(f) $\lim_{x \rightarrow -3} \frac{f(x)}{x^2} = \frac{\lim_{x \rightarrow -3} f(x)}{\lim_{x \rightarrow -3} x^2} = \frac{-2}{(-3)^2} = \boxed{\frac{-2}{9}}$



$$1. \lim_{x \rightarrow 1} \frac{\frac{1}{x}-1}{x-1} = \lim_{x \rightarrow 1} \frac{\frac{1-x}{x}}{x-1} = \lim_{x \rightarrow 1} \frac{1-x}{x} \frac{1}{x-1} = \lim_{x \rightarrow 1} \frac{-(x-1)}{x(x-1)}$$

$$= \lim_{x \rightarrow 1} \frac{-1}{x} = \frac{-1}{1} = \boxed{-1}$$

2. Answer the following questions about the function $y = f(x)$ graphed below.

(a) $f(1) = \boxed{1}$

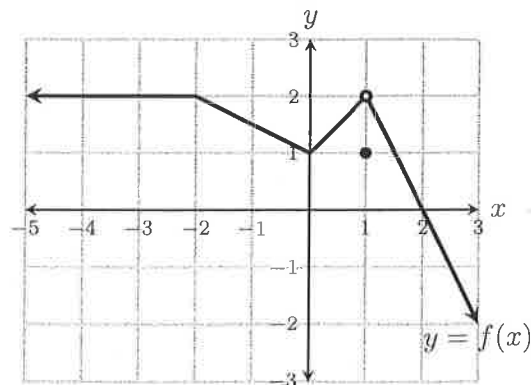
(b) $\lim_{x \rightarrow 1} f(x) = \boxed{2}$

(c) $\lim_{x \rightarrow 1} f(-3x) = f(-3 \cdot 1) = f(-3) = \boxed{2}$

(d) $f \circ f(2) = f(f(2)) = f(0) = \boxed{1}$

(e) $\lim_{x \rightarrow 0} f(x) = \boxed{1}$

(f) $\lim_{x \rightarrow 0} \frac{5f(x)}{x+3} = \frac{\lim_{x \rightarrow 0} 5f(x)}{\lim_{x \rightarrow 0} (x+3)} = \frac{5 \cdot 1}{0+3} = \boxed{\frac{5}{3}}$



$$1. \lim_{x \rightarrow 4} \frac{x-4}{x^2-16} = \lim_{x \rightarrow 4} \frac{x-4}{(x+4)(x-4)} = \lim_{x \rightarrow 4} \frac{1}{x+4} = \frac{1}{4+4} = \boxed{\frac{1}{8}}$$

2. Answer the following questions about the function $y = f(x)$ graphed below.

(a) $f(-1) = \boxed{2}$

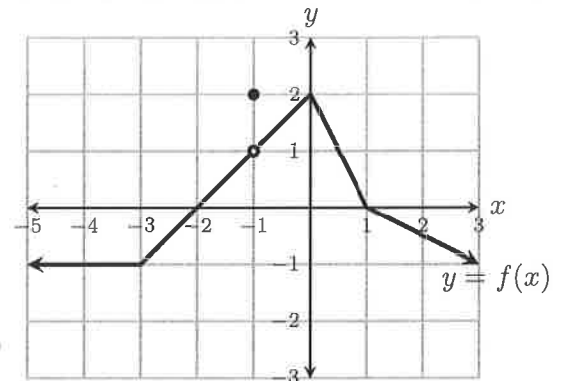
(b) $\lim_{x \rightarrow -1} f(x) = \boxed{1}$

(c) $\lim_{x \rightarrow 2} f(x) = \boxed{-\frac{1}{2}}$

(d) $\lim_{x \rightarrow 1} f(-2x) = \boxed{0}$

(e) $f \circ f(1) = f(f(1)) = f(0) = \boxed{2}$

(f) $\lim_{x \rightarrow 1} \frac{1+f(x)}{1+x} = \frac{\lim_{x \rightarrow 1} (1+f(x))}{\lim_{x \rightarrow 1} (1+x)} = \frac{1+f(1)}{1+1} = \boxed{\frac{1}{2}}$



$$1. \lim_{x \rightarrow 3} \frac{x^2+7x-30}{x-3} = \lim_{x \rightarrow 3} \frac{(x-3)(x+10)}{x-3} = \lim_{x \rightarrow 3} (x+10) = \boxed{13}$$

2. Answer the following questions about the function $y = f(x)$ graphed below.

(a) $f(-1) = \boxed{-2}$

(b) $\lim_{x \rightarrow -1} f(x) = \boxed{-1}$

(c) $\lim_{x \rightarrow 3} f(x) = \boxed{1}$

(d) $\lim_{x \rightarrow 1} f(2x) = f(2 \cdot 1) = f(2) = \boxed{\frac{1}{2}}$

(e) $f \circ f(3) = f(f(3)) = f(1) = \boxed{0}$

(f) $\lim_{x \rightarrow 2} x^2 f(x) = \lim_{x \rightarrow 2} x^2 \lim_{x \rightarrow 2} f(x) = 2^2 \cdot \frac{1}{2} = \boxed{2}$

