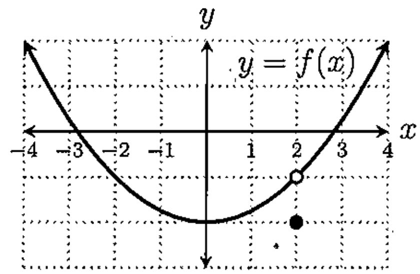
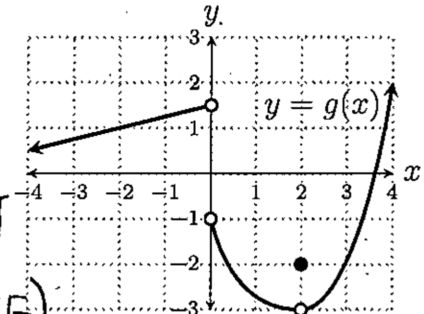
Name: Richard

QUIZ 1

MATH 200
August 22, 2024

1. Answer the questions about the functions graphed below.





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

(b) $\lim\limits_{x\to 2} \dfrac{f(x)}{g(x)} = \dfrac{\lim\limits_{x\to 2} f(x)}{\lim\limits_{x\to 2} g(x)} = \dfrac{-1}{-3} = \boxed{\dfrac{1}{3}}$

(c) $\lim\limits_{x\to 0^+} g(x) = \boxed{-1}$

(d) $\lim\limits_{x\to -2} \left(2f(x) - 5g(x)\right) = 2\lim\limits_{x\to -2} f(x) - 5\lim\limits_{x\to -2} g(x)$
$= 2\cdot(-1) - 5\cdot(1) = \boxed{-7}$

(e) $\lim\limits_{x\to 0} f(x)g(x) = \boxed{\text{DNE}}$ (because $\lim\limits_{x\to 0} g(x)$ DNE)

2. $\lim\limits_{x\to 3} \dfrac{\sqrt{x^2+4}}{2x} = \dfrac{\lim\limits_{x\to 3}\sqrt{x^2+4}}{\lim\limits_{x\to 3} 2x} = \dfrac{\sqrt{\lim\limits_{x\to 3}(x^2+4)}}{2\cdot 3} = \boxed{\dfrac{\sqrt{13}}{6}}$

3. $\lim\limits_{x\to 1/5} \dfrac{5x+1}{32^x} = \dfrac{\lim\limits_{x\to 1/5}(5x+1)}{\lim\limits_{x\to 1/5} 32^x} = \dfrac{5\left(\frac{1}{5}\right)+1}{32^{1/5}} = \dfrac{2}{\sqrt[5]{32}} = \dfrac{2}{2} = \boxed{1}$

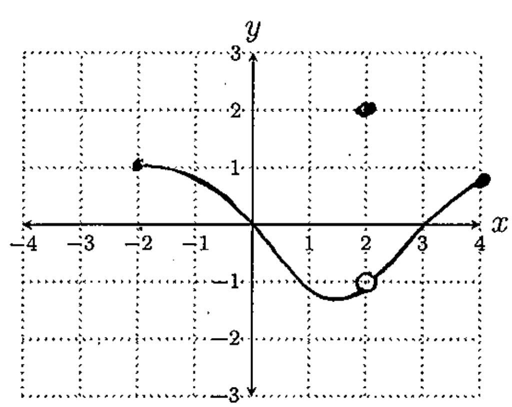
4. Draw the graph of **one** function f, with domain $[-2, 4]$, meeting the following conditions.

(a) $\lim\limits_{x\to -2^+} f(x) = 1$

(b) $\lim\limits_{x\to 2} f(x) = -1$

(c) $f(2) = 2$

(d) $\lim\limits_{x\to 3} f(x) = 0$



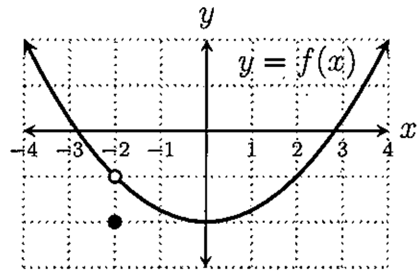
$y = f(x)$

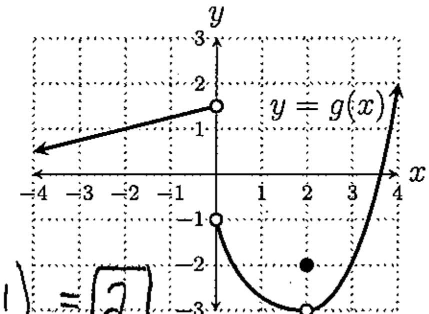
Name: Richard

Quiz 1

MATH 200
August 22, 2024

1. Answer the questions about the functions graphed below.





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

(b) $\lim_{x\to 2} \frac{f(x)}{g(x)} = \frac{\lim_{x\to 2} f(x)}{\lim_{x\to 2} g(x)} = \frac{-1}{-3} = \boxed{\frac{1}{3}}$

(c) $\lim_{x\to 0} g(x) = \boxed{\text{DNE}}$

(d) $\lim_{x\to 2} (2f(x) - 5g(x)) = 2\lim_{x\to 2} f(x) - 5\lim_{x\to 2} g(x)$
$= 2\cdot(-1) - 5(-3) = \boxed{13}$

(e) $\lim_{x\to 0^+} f(x)g(x) = \left(\lim_{x\to 0^+} f(x)\right)\left(\lim_{x\to 0^+} g(x)\right) = (-2)(-1) = \boxed{2}$

2. $\lim_{x\to 1/4} \frac{16^x}{8x+2} = \frac{\lim_{x\to 1/4} 16^x}{\lim_{x\to 1/4} (8x+2)} = \frac{16^{1/4}}{8(\frac{1}{4})+2} = \frac{\sqrt[4]{16}}{4} = \frac{2}{4} = \boxed{\frac{1}{2}}$

3. $\lim_{x\to 2} \frac{\sqrt{x^2+4}}{2x} = \frac{\lim_{x\to 2} \sqrt{x^2+4}}{\lim_{x\to 2} 2x} = \frac{\sqrt{\lim_{x\to 2}(x^2+4)}}{2\cdot 2} = \frac{\sqrt{8}}{4} = \frac{2\sqrt{2}}{4} = \boxed{\frac{\sqrt{2}}{2}}$

4. Draw the graph of **one** function f, with domain $[-4, 2]$, meeting the following conditions.

(a) $\lim_{x\to 2^-} f(x) = 1$

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

(c) $f(-2) = 2$

(d) $\lim_{x\to -3} f(x) = 0$