STEPs Math Quiz 2

Thursday, July 24, 2025 Class time: 8:00 AM - 9:00 AM **Version B**

Name: ______________________ National ID: ______________________

Select your section instructor: ☐ Majid/Hamza ☐ Asaad

1. Solve the following questions. Show your work.
   (a) Simplify the value of $e^{\ln(4)}$ $=$ ____________
   (b) If $0 \leq x \leq \frac{\pi}{2}$ and $\sin(x)^2 - \cos(x)^2 = \frac{1}{2}$, find the value of $\tan(x)$ $=$ ____________

2. For each of the following functions, determine if they are continuous at all real numbers. If not, state the points of discontinuity and its type (essential, removable, or jump). Show your work.

(a)

$$f(x) = \begin{cases} 2^x - 1 & \text{if } x \leq 0 \\ \log_{10}(x) & \text{if } x > 0 \end{cases}$$

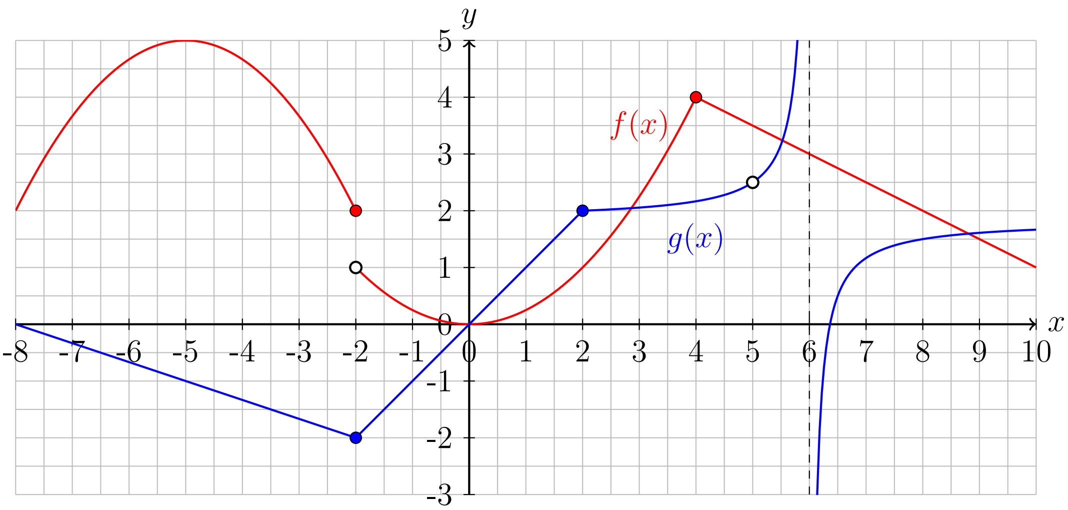
(b)

$$g(x) = \begin{cases} \frac{x^2-4}{x-2} & \text{if } x \leq 0 \\ x^3 - 3x + 2 & \text{if } 0 < x \leq 2 \\ 2\sqrt{x+2} & \text{if } x > 2 \end{cases}$$

(c)

$$h(x) = \frac{x^2 + 7x + 12}{x^2 - 16}$$

3. Below is the graph of functions $f(x)$ and $g(x)$. Determine the value of the following expressions.



(a)

$$\lim_{x \to 2} \frac{f(x)}{g(x)} =$$

(b)

$$f(5) =$$

(c)

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

(d)

$$\lim_{x \to -2^-} g(x) =$$

(e)

$$\lim_{x \to 6^+} g(x) =$$

(f)

$$\lim_{x \to 1} (g(x) - g(-x)) =$$

4. Evaluate the following limits. Show your work.

(a)

$$\lim_{x\to 4} \frac{x-4}{2-\sqrt{x}} =$$

(b)

$$\lim_{x\to 2} \frac{\log_3(2x^2+1)}{x^2} =$$

(c)

$$\lim_{x\to -2} (x^5 - 3\sqrt{-2x} + 1) =$$

(d)

$$\lim_{x\to\infty} \frac{4^{2x+1} + 2^{4x} + 1}{4^{2x}} =$$

(e)

$$\lim_{x\to 3} \frac{x^2 - 4x + 3}{-x^2 + 2x + 3} =$$

(f)

$$\lim_{x\to 1} \frac{x^2 - 1}{x^3 - 1} =$$

(g)

$$\lim_{x\to 2^-} \frac{7}{x-2} =$$

(h)

$$\lim_{x\to\infty} \frac{4^{2x}}{\sqrt{x+1}} =$$

(i)

$$\lim_{x\to\infty} (\sqrt{x^2 + 2x} - x) =$$

STEPs Math Quiz 2

Thursday, July 24, 2025 Class time: 8:00 AM - 9:00 AM **Version C**

Name: ______________________ National ID: ______________________

Select your section instructor: ☐ Majid/Hamza ☐ Asaad

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1. Solve the following questions. Show your work.

   (a) If $0 \le x \le \frac{\pi}{2}$ and $\sin(x)^2 - \cos(x)^2 = \frac{1}{2}$, find the value of $\tan(x)$ = __________

   (b) Simplify the value of $e^{\ln(4)}$ = __________

2. For each of the following functions, determine if they are continuous at all real numbers. If not, state the points of discontinuity and its type (essential, removable, or jump). Show your work.

(a)

$$f(x) = \frac{x^2 + 7x + 12}{x^2 - 16}$$

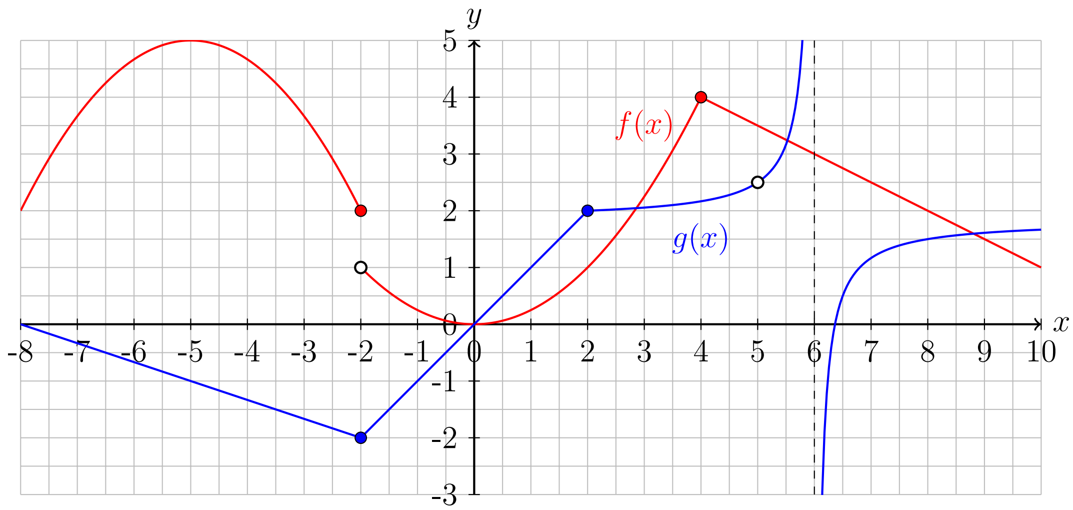
(b)

$$g(x) = \begin{cases} \frac{x^2-4}{x-2} & \text{if } x \le 0 \\ x^3 - 3x + 2 & \text{if } 0 < x \le 2 \\ 2\sqrt{x+2} & \text{if } x > 2 \end{cases}$$

(c)

$$h(x) = \begin{cases} 2^x - 1 & \text{if } x \le 0 \\ \log_{10}(x) & \text{if } x > 0 \end{cases}$$

3. Below is the graph of functions $f(x)$ and $g(x)$. Determine the value of the following expressions.



(a) $g(5) =$

(b) $\lim_{x \to -5} \frac{g(x)}{f(x)} =$

(c) $\lim_{x \to 6^+} g(x) =$

(d) $\lim_{x \to 2} (g(x) - g(-x)) =$

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

(f) $\lim_{x \to 10} f(x) =$

4. Evaluate the following limits. Show your work.

(a)

$$\lim_{x \to 2^-} \frac{7}{x-2} =$$

(b)

$$\lim_{x \to \infty} \frac{4^{2x+1} + 2^{4x} + 1}{4^{2x}} =$$

(c)

$$\lim_{x \to \infty} \frac{4^{2x}}{\sqrt{x+1}} =$$

(d)

$$\lim_{x \to 3} \frac{x^2 - 4x + 3}{-x^2 + 2x + 3} =$$

(e)

$$\lim_{x \to \infty} (\sqrt{x^2 + 2x} - x) =$$

(f)

$$\lim_{x \to -2} (x^5 - 3\sqrt{-2x} + 1) =$$

(g)

$$\lim_{x \to 4} \frac{x-4}{2 - \sqrt{x}} =$$

(h)

$$\lim_{x \to 2} \frac{\log_3(2x^2 + 1)}{x^2} =$$

(i)

$$\lim_{x \to 1} \frac{x^2 - 1}{x^3 - 1} =$$

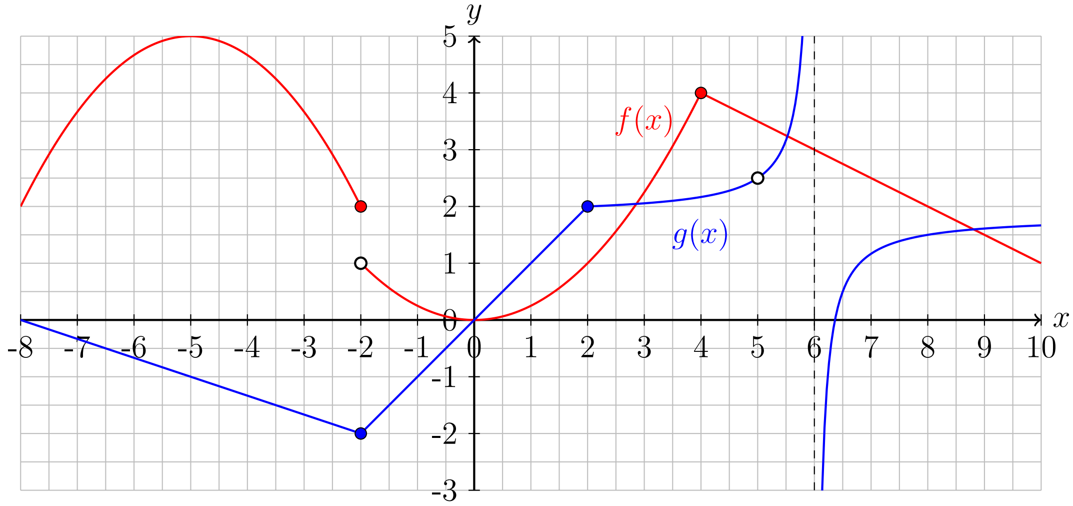
STEPs Math Quiz 2

Thursday, July 24, 2025 Class time: 8:00 AM - 9:00 AM **Version B**

Name: ______________________ National ID: ______________________

Select your section instructor: ☑ Majid/Hamza ☐ Asaad

1. Below is the graph of functions $f(x)$ and $g(x)$. Determine the value of the following expressions.



(a) $$\lim_{x\to 2} \frac{f(x)}{g(x)} =$$

(b) $$f(5) =$$

(c) $$\lim_{x\to -2^+} f(x) =$$

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

(e) $$\lim_{x\to 6^+} g(x) =$$

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

2. Find x for these equations. Show your work.
   (a) $\cos(x)^2 - \sqrt{3}\sin(x)\cos(x) = \frac{1}{2}$, $x =$ ____________

   (b) $e^x - 2e^{-x} = 1$, $x =$ ____________

3. For each of the following functions, determine if they are continuous at all real numbers. If not, state the points of discontinuity and its type (essential, removable, or jump). Show your work.

(a)
$$f(x) = \begin{cases} 2^x - 1 & \text{if } x \leq 0 \\ \log_{10}(x) & \text{if } x > 0 \end{cases}$$

(b)
$$g(x) = \begin{cases} \frac{x^2-4}{x-2} & \text{if } x \leq 0 \\ x^3 - 3x + 2 & \text{if } 0 < x \leq 2 \\ 2\sqrt{x+2} & \text{if } x > 2 \end{cases}$$

(c)
$$h(x) = \frac{x^2 + 7x + 12}{x^2 - 16}$$

4. Evaluate the following limits. Show your work.

(a)

$$\lim_{x\to\infty} \sqrt{x^2+2x} - x =$$

(b)

$$\lim_{x\to\infty} \frac{3^x - 1}{2^x + 2025x^{1447}} =$$

(c)

$$\lim_{x\to 0} \frac{\sin(2x)}{x} =$$

(d)

$$\lim_{x\to 0^+} (1+5x)^{\frac{2}{x}} =$$

(e)

$$\lim_{x\to 0} (\frac{x+\sin(x)}{x^2})^x =$$

(f)

$$\lim_{x\to -\infty} \frac{e^{2x}}{x-1} =$$

(g)

$$\lim_{x\to\infty} \frac{log_3(x+1)+2x}{log_2(x)+22} =$$

(h)

$$\lim_{x\to 2} \frac{x^2-16}{\sqrt{x}-2} =$$

(i)

$$\lim_{x\to\infty} \frac{4^{2x+1}+2^{4x}+26}{4^{2x}} =$$

(j)

$$\lim_{x\to\pi} \tan(\frac{x}{2}) - \frac{1}{\cos(\frac{x}{2})} =$$

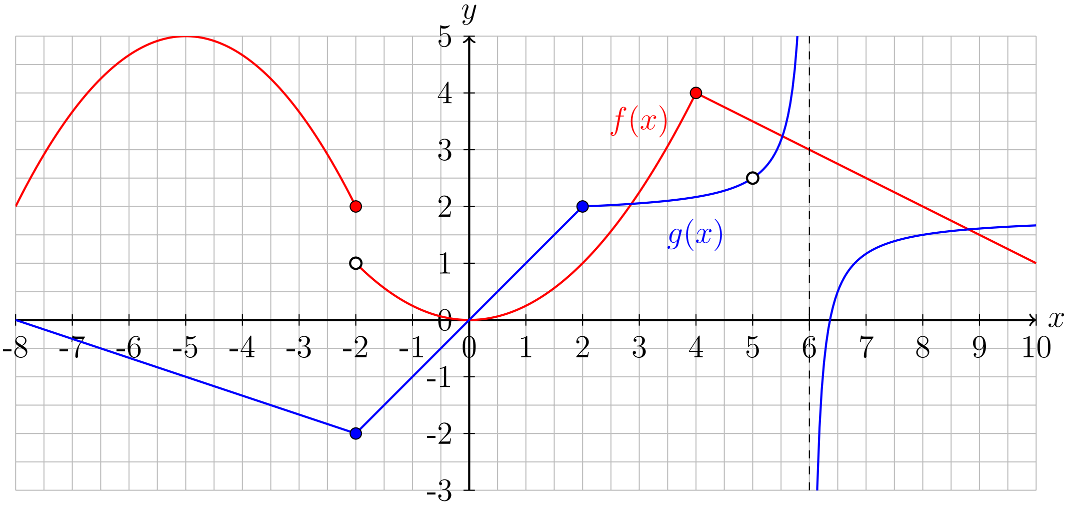
STEPs Math Quiz 2

Thursday, July 24, 2025 Class time: 8:00 AM - 9:00 AM **Version C**

Name: ______________________ National ID: ______________________

Select your section instructor: ☑ Majid/Hamza ☐ Asaad

1. Below is the graph of functions $f(x)$ and $g(x)$. Determine the value of the following expressions.



(a) $g(5) =$

(c) $\lim_{x\to 2} \frac{g(x)}{f(x)} =$

(e) $\lim_{x\to 6^-} g(x) =$

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

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

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

2. Find x for these equations. Show your work.

(a) $\cos(x)^2 - \sqrt{3}\sin(x)\cos(x) = -\frac{1}{2}$, $x =$ ____________

(b) $e^x - 2e^{-x} = 1$, $x =$ ____________

3. For each of the following functions, determine if they are continuous at all real numbers. If not, state the points of discontinuity and its type (essential, removable, or jump). Show your work.

(a) $$f(x) = \begin{cases} 2^x - 1 & \text{if } x \le 0 \\ \log_{10}(x) & \text{if } x > 0 \end{cases}$$

(b) $$g(x) = \begin{cases} \frac{x^2-4}{x-2} & \text{if } x \le 0 \\ x^3 - 3x + 2 & \text{if } 0 < x \le 2 \\ 2\sqrt{x+2} & \text{if } x > 2 \end{cases}$$

(c) $$h(x) = \frac{x^2 + 7x + 12}{x^2 - 16}$$

4. Evaluate the following limits. Show your work.

(a)

$$\lim_{x \to 0} \frac{\sin(2x)}{x} =$$

(b)

$$\lim_{x \to \infty} \sqrt{x^2 + 2x} - x =$$

(c)

$$\lim_{x \to \infty} \frac{3^x - 1}{2^x + 2025x^{1447}} =$$

(d)

$$\lim_{x \to 0^+} (1 + 5x)^{\frac{2}{x}} =$$

(e)

$$\lim_{x \to \pi} \tan(\frac{x}{2}) - \frac{1}{\cos(\frac{x}{2})} =$$

(f)

$$\lim_{x \to \infty} \frac{log_3(x + 1) + 2x}{log_2(x) + 22} =$$

(g)

$$\lim_{x \to 2} \frac{x^2 - 16}{\sqrt{x} - 2} =$$

(h)

$$\lim_{x \to \infty} \frac{4^{2x+1} + 2^{4x} + 26}{4^{2x}} =$$

(i)

$$\lim_{x \to -\infty} \frac{e^{2x}}{x - 1} =$$

(j)

$$\lim_{x \to 0} (\frac{x + \sin(x)}{x^2})^x =$$

STEPs Math Quiz 2

Thursday, July 24, 2025 Class time: 9:15 AM - 10:15 AM **Version B**

Name: ______________________ National ID: ______________________

Select your section instructor: ☐ Majid/Hamza ☐ Asaad

1. Solve the following questions. Show your work.
   (a) Simplify the value of $e^{\ln(7)}$ = ____________
   (b) If $\frac{\pi}{2} \le x \le \pi$ and $\sin(x)^2 - \cos(x)^2 = \frac{1}{3}$, find the value of $\tan(x)$ = ____________

2. For each of the following functions, determine if they are continuous at all real numbers. If not, state the points of discontinuity and its type (essential, removable, or jump). Show your work.

(a)

$$f(x) = \begin{cases} x^2 - x - 1 & \text{if } x \le 2 \\ \log_2(x) & \text{if } x > 2 \end{cases}$$

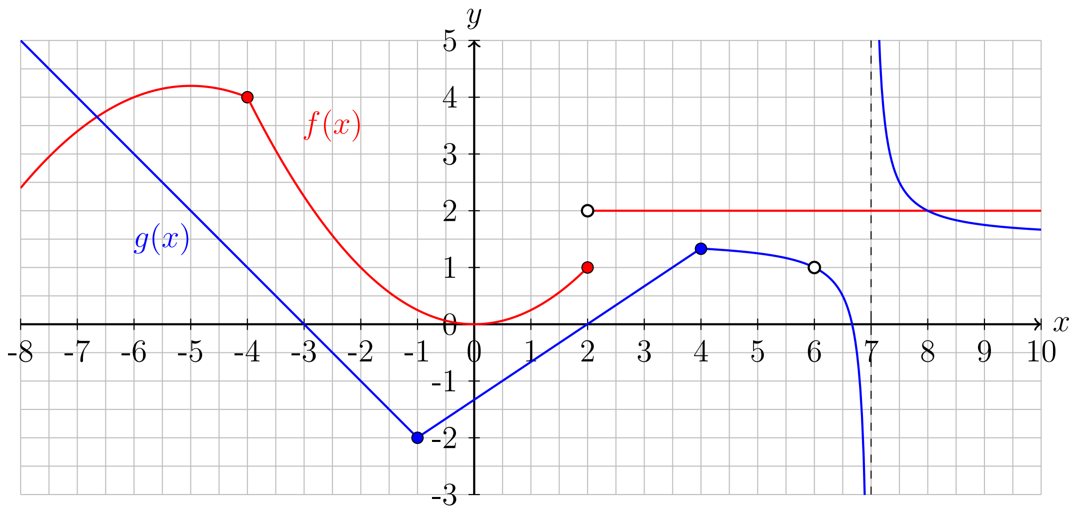
(b)

$$g(x) = \begin{cases} \frac{x^2-1}{x+1} + 4 & \text{if } x \le 0 \\ \sqrt{9-x} & \text{if } 0 < x \le 3 \\ \log_3(x) & \text{if } x > 3 \end{cases}$$

(c)

$$h(x) = \frac{x^2 + x - 2}{x^3 - 1}$$

3. Below is the graph of functions $f(x)$ and $g(x)$. Determine the value of the following expressions.



(a)

$$f(6) =$$

(b)

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

(c)

$$\lim_{x \to 7^+} g(x) =$$

(d)

$$\lim_{x \to -4} \frac{f(x)}{g(x)} =$$

(e)

$$\lim_{x \to -2} f(x) + g(x) =$$

(f)

$$\lim_{x \to 7} g(-x) =$$

4. Evaluate the following limits. Show your work.

(a)

$$\lim_{x \to 9} \frac{3 - \sqrt{x}}{9 - x} =$$

(b)

$$\lim_{x \to 8} \frac{\sqrt[3]{x} - 1}{x - 1} =$$

(c)

$$\lim_{x \to 4} (x^2 - \sqrt{x} - \log_2(x^2)) =$$

(d)

$$\lim_{x \to 0^-} 9^{\frac{1}{x^2}} =$$

(e)

$$\lim_{x \to 2} \frac{2x^2 - 6x + 4}{3x^2 - 3x - 6} =$$

(f)

$$\lim_{x \to 2} \frac{x^2 - 4}{x^2 - 5x + 6} =$$

(g)

$$\lim_{x \to -3^+} \frac{-3}{(x + 3)^2} =$$

(h)

$$\lim_{x \to \infty} \frac{2^{2x}}{3^x} =$$

(i)

$$\lim_{x \to \infty} (\sqrt{4x^2 + 4x} - 2x) =$$

STEPs Math Quiz 2

Thursday, July 24, 2025 Class time: 9:15 AM - 10:15 AM **Version C**

Name: ________________________ National ID: ________________________

Select your section instructor: ☐ Majid/Hamza ☐ Asaad

1. Solve the following questions. Show your work.
   (a) Simplify the value of $e^{\ln(7)}$ $=$ __________
   (b) If $\frac{\pi}{2} \leq x \leq \pi$ and $\sin(x)^2 - \cos(x)^2 = \frac{1}{3}$, find the value of $\tan(x)$ $=$ __________

2. For each of the following functions, determine if they are continuous at all real numbers. If not, state the points of discontinuity and its type (essential, removable, or jump). Show your work.

(a)

$$f(x) = \frac{x^2 + x - 2}{x^3 - 1}$$

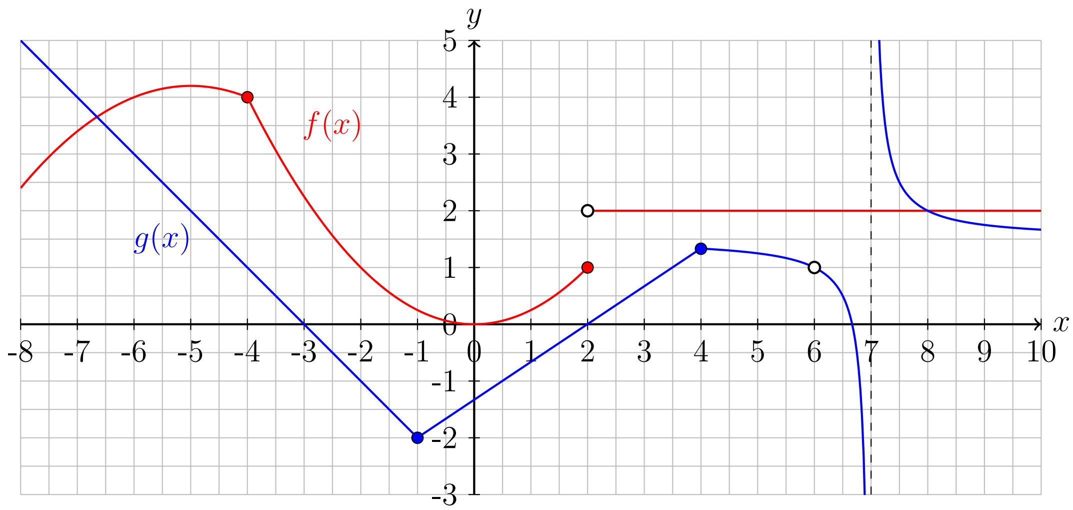
(b)

$$g(x) = \begin{cases} \frac{x^2-1}{x+1} + 4 & \text{if } x \leq 0 \\ \sqrt{9-x} & \text{if } 0 < x \leq 3 \\ \log_3(x) & \text{if } x > 3 \end{cases}$$

(c)

$$h(x) = \begin{cases} x^2 - x - 1 & \text{if } x \leq 2 \\ \log_2(x) & \text{if } x > 2 \end{cases}$$

3. Below is the graph of functions $f(x)$ and $g(x)$. Determine the value of the following expressions.



(a)

$$\lim_{x \to -4} f(x) =$$

(b)

$$\lim_{x \to -4} \frac{g(x)}{f(x)} =$$

(c)

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

(d)

$$g(6) =$$

(e)

$$\lim_{x \to 7^-} g(x) =$$

(f)

$$\lim_{x \to -2} f(x) + g(-x) =$$

4. Evaluate the following limits. Show your work.

(a)

$$\lim_{x\to -3^+} \frac{-3}{(x+3)^2} =$$

(b)

$$\lim_{x\to 9} \frac{3-\sqrt{x}}{9-x} =$$

(c)

$$\lim_{x\to 8} \frac{\sqrt[3]{x}-1}{x-1} =$$

(d)

$$\lim_{x\to\infty} \frac{2^{2x}}{3^x} =$$

(e)

$$\lim_{x\to\infty} (\sqrt{4x^2+4x}-2x) =$$

(f)

$$\lim_{x\to 4} (x^2-\sqrt{x}-\log_2(x^2)) =$$

(g)

$$\lim_{x\to 2} \frac{x^2-4}{x^2-5x+6} =$$

(h)

$$\lim_{x\to 0^-} 9^{\frac{1}{x^2}} =$$

(i)

$$\lim_{x\to 2} \frac{2x^2-6x+4}{3x^2-3x-6} =$$

STEPs Math Quiz 2

Thursday, July 24, 2025 Class time: 10:30 AM - 11:30 AM **Version B**

Name: ______________________ National ID: ______________________

Select your section instructor: ☐ Majid/Hamza ☐ Asaad

1. Solve the following questions. Show your work.
   (a) Simplify the value of $e^{-\ln(5)}$ = ____________
   (b) If $\pi \leq x \leq \frac{3\pi}{2}$ and $\sin(x)^2 - \cos(x)^2 = \frac{1}{4}$, find the value of $\tan(x)$ = ____________

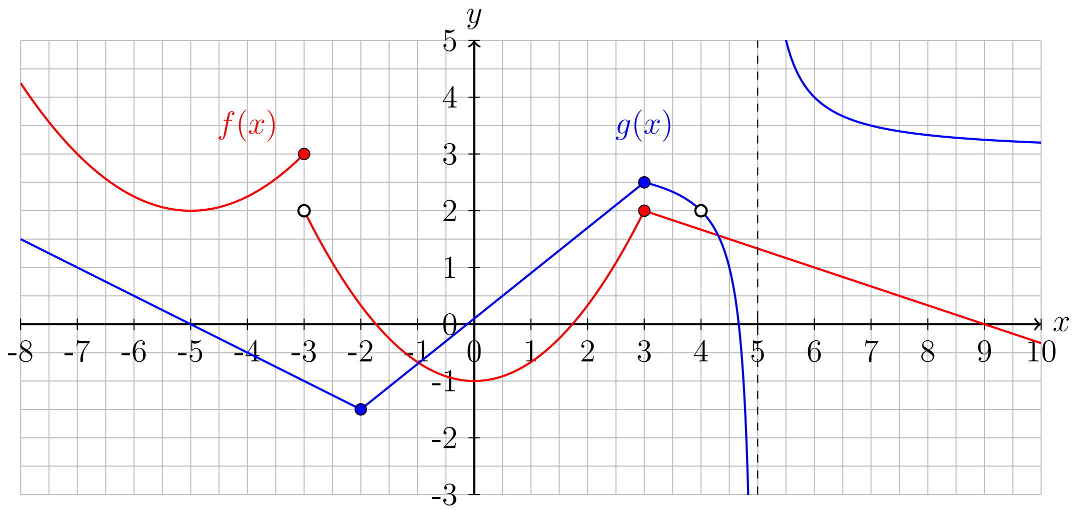
2. For each of the following functions, determine if they are continuous at all real numbers. If not, state the points of discontinuity and its type (essential, removable, or jump). Show your work.

(a)
$$f(x) = \begin{cases} x^2 - 1 & \text{if } x \leq 1 \\ -\log_3(x) & \text{if } x > 1 \end{cases}$$

(b)
$$g(x) = \begin{cases} \frac{x^2-1}{x+1} & \text{if } x \leq 0 \\ -\cos(\pi x) & \text{if } 0 < x \leq 1 \\ \log_2(x+1) & \text{if } x > 1 \end{cases}$$

(c)
$$h(x) = \frac{x^2 - 1}{x^2 - 4x + 3}$$

3. Below is the graph of functions $f(x)$ and $g(x)$. Determine the value of the following expressions.



(a) $f(-3) =$

(b) $\lim_{x \to 3} f(x) =$

(c) $\lim_{x \to 4} g(x) =$

(d) $\lim_{x \to -7} \frac{f(x)}{g(x)} =$

(e) $\lim_{x \to 5^-} g(x) =$

(f) $\lim_{x \to 6} f(x) + g(-x) =$

4. Evaluate the following limits. Show your work.

(a)

$$\lim_{x\to 1} \frac{x-1}{\sqrt{x+3}-2} =$$

(b)

$$\lim_{x\to 5} \frac{x-3}{\log_4(3x+1)} =$$

(c)

$$\lim_{x\to -1} (2x^3 + \sqrt{-x} + 2^x) =$$

(d)

$$\lim_{x\to\infty} \frac{2^{3x+1} + 4^{x+1} + 1}{8^x} =$$

(e)

$$\lim_{x\to -1} \frac{x^3 + 4x^2 + 3x}{-x^3 + x^2 + 2x} =$$

(f)

$$\lim_{x\to 0^-} 7^{\frac{1}{x^3}} =$$

(g)

$$\lim_{x\to 2^+} \frac{-x}{\sqrt{x^2-4}} =$$

(h)

$$\lim_{x\to\infty} \frac{x^4 + 3x^3 + 2\sqrt{x}}{x^2 + 3^x} =$$

(i)

$$\lim_{x\to\infty} (x - \sqrt{x^2 - 4x}) =$$

STEPs Math Quiz 2

Thursday, July 24, 2025 Class time: 10:30 AM - 11:30 AM **Version C**

Name: ____________________ National ID: ____________________

Select your section instructor: ☐ Majid/Hamza ☐ Asaad

1. Solve the following questions. Show your work.
   (a) Simplify the value of $e^{-\ln(5)}$ = ____________
   (b) If $\pi \le x \le \frac{3\pi}{2}$ and $\sin(x)^2 - \cos(x)^2 = \frac{1}{4}$, find the value of $\tan(x)$ = ____________

2. For each of the following functions, determine if they are continuous at all real numbers. If not, state the points of discontinuity and its type (essential, removable, or jump). Show your work.

(a)

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

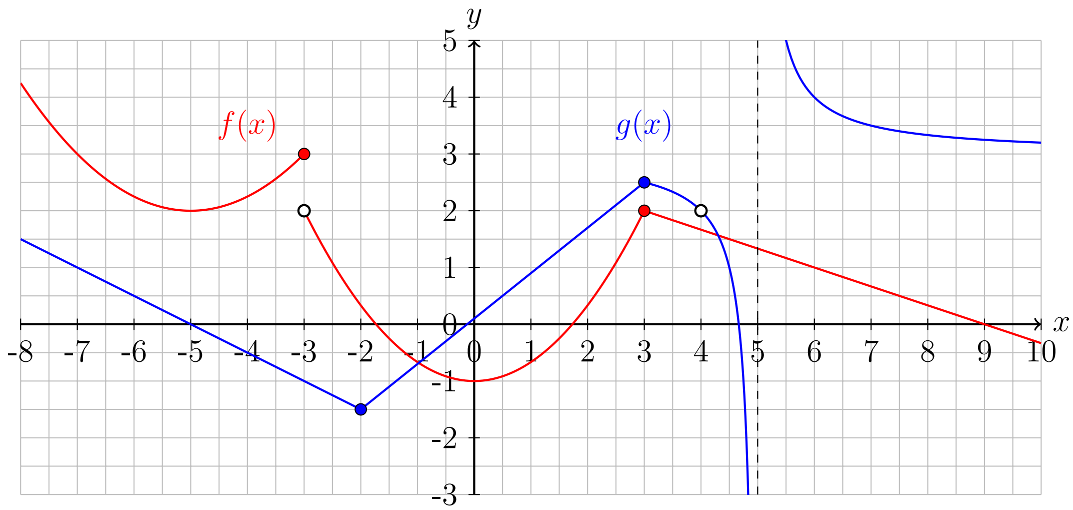
(b)

$$g(x) = \begin{cases} \frac{x^2-1}{x+1} & \text{if } x \le 0 \\ -\cos(\pi x) & \text{if } 0 < x \le 1 \\ \log_2(x+1) & \text{if } x > 1 \end{cases}$$

(c)

$$h(x) = \begin{cases} x^2-1 & \text{if } x \le 1 \\ -\log_3(x) & \text{if } x > 1 \end{cases}$$

3. Below is the graph of functions $f(x)$ and $g(x)$. Determine the value of the following expressions.



(a)

$$\lim_{x\to 3} g(x) =$$

(b)

$$g(4) =$$

(c)

$$\lim_{x\to 3} f(x) + g(-x) =$$

(d)

$$\lim_{x\to -3^+} f(x) =$$

(e)

$$\lim_{x\to -7} \frac{g(x)}{f(x)} =$$

(f)

$$\lim_{x\to 5^+} g(x) =$$

4. Evaluate the following limits. Show your work.

(a)
$$\lim_{x\to 5} \frac{x-3}{\log_4(3x+1)} =$$

(b)
$$\lim_{x\to 0^-} 7^{\frac{1}{x^3}} =$$

(c)
$$\lim_{x\to -1} (2x^3 + \sqrt{-x} + 2^x) =$$

(d)
$$\lim_{x\to\infty} \frac{2^{3x+1} + 4^{x+1} + 1}{8^x} =$$

(e)
$$\lim_{x\to\infty} (x - \sqrt{x^2 - 4x}) =$$

(f)
$$\lim_{x\to 2^+} \frac{-x}{\sqrt{x^2-4}} =$$

(g)
$$\lim_{x\to\infty} \frac{x^4 + 3x^3 + 2\sqrt{x}}{x^2 + 3^x} =$$

(h)
$$\lim_{x\to 1} \frac{x-1}{\sqrt{x+3} - 2} =$$

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