Name: due January 28

Math 125 **Homework Assignment 3** **Spring 2026**

1. Use algebra to evaluate $\lim_{x \to 2} \dfrac{x^2 + 3x - 10}{3x^2 - 5x - 2}$.

2. Use a calculator to estimate $\lim_{x \to 0} \dfrac{2^x - 1}{x}$ to the nearest thousandth. Include a table of values with both positive and negative inputs.

3. Evaluate $\lim_{x \to 6^-} \big(2x - \lfloor x \rfloor\big)$.

4. Consider the function $f(x) = \begin{cases} x, & \text{if } x < 1; \\ 4, & \text{if } 1 \le x \le 5; \\ x^2, & \text{if } x > 5. \end{cases}$. Find $\lim_{x \to 1^-} f(x)$ and $\lim_{x \to 5^+} f(x)$.

5. Explain why the limit $\lim_{x \to 3} \dfrac{x^2 - 3x}{|x - 3|}$ does not exist.

Name: due January 26

Math 125 **Homework Assignment 2** **Spring 2026**

1. Find the domain of the function $f(x) = \sqrt{16 - x^2}$. Express your answer in interval notation.

2. Find the domain of the function $g(x) = \dfrac{x+2}{x^2 - x + 56}$.

3. Give an example of a rational function $F(x)$ for which $F(2) = 0$ and F is undefined at ± 3.

4. Consider the functions $f(x) = x^2 - 2x$ and $g(x) = x + 3$. Find and simplify each of the following functions: $(f \circ f)(x)$, $(f \circ g)(x)$, $(g \circ f)(x)$, and $(g \circ g)(x)$.

   Note that these functions can also be written as $f(f(x))$, $f(g(x))$, $g(f(x))$, and $g(g(x))$, respectively.

5. Consider the function $h(x) = x^2 + x$. Find and fully simplify the quantity $\dfrac{h(x+t) - h(x-t)}{2t}$.

Name: due January 23

Math 125 **Homework Assignment 1** **Spring 2026**

1. Find an equation for the line that goes through the points $(-2, 3)$ and $(4, 7)$.

2. Find the point of intersection of the lines $y = 2x + 3$ and $y + 3x = 17$.

3. Let ℓ be the line that is the perpendicular bisector of the line segment joining $(1, 1)$ and $(7, 11)$. The line ℓ cuts off a triangle in the first quadrant. Find the area of this triangle.