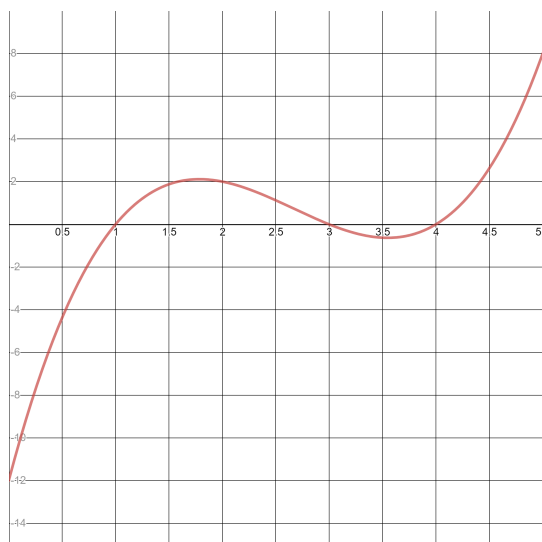
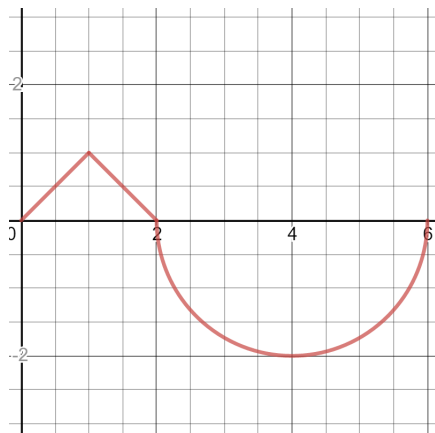


1. **(Review)** Determine where the function  $f(x) = \frac{x^2 - 9}{2x^2 - 10x + 12}$  is discontinuous.
2. **(Review)** Use the Intermediate Value Theorem to show that  $25 - 8x^2 - x^3 = 0$  has a solution in the interval  $[-2, 4]$ .
3. **(Warm-up)** What is the definition of a Riemann sum for a function  $f(x)$  on an interval  $[a, b]$ ? What are Riemann sums useful for?
4. **(Warm-up)** Sketch the graph of  $f(x) = x^2$  on the interval  $[0, 5]$ . Draw the left endpoint approximation for the area under the graph with 5 subintervals, and calculate the left Riemann sum that corresponds to the rectangles. Is this an over or under estimate?
5. Consider the function  $f(x) = x^3 - 8x^2 + 19x - 12 = (x - 1)(x - 3)(x - 4)$  on the interval  $[0, 5]$  (the graph is shown below)



- (a) Sketch the midpoint approximation for  $f(x)$  using 5 subintervals.
- (b) Calculate the left, right, and midpoint Riemann sums for  $f(x)$  on  $[0, 5]$  using 5 subintervals.

6. Consider the following graph of a function  $g$ :



By examining the graph, compute the following:

- (a)  $\int_0^2 g(x) dx$
- (b)  $\int_2^6 g(x) dx$
- (c)  $\int_0^6 g(x) dx$