Part 1. Figuring Sod Requirements


You need to figure out how much sod would be required to cover the area shown in grey in the photo on the left. The functions for the edges of the grey area are given on the graph below. The units are in **tens of feet**. The second vertical line is at $x = 3.8$.

Find the amount of sod needed to the nearest square foot (Watch units! Units for functions given were in tens of feet and you need SQUARE FEET).
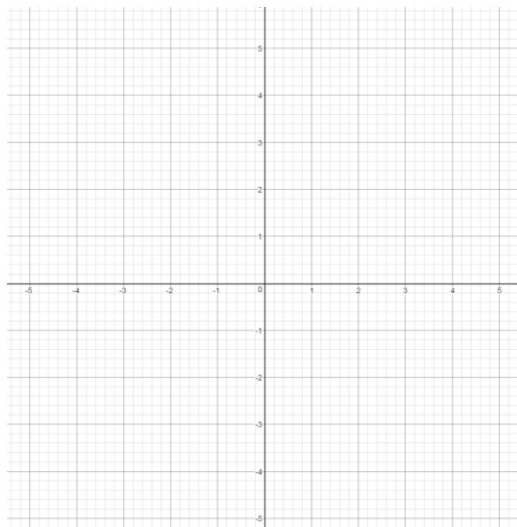
$$f(x) = -\frac{1}{2}x + \frac{3}{4}\cos 2x + \frac{15}{2}$$
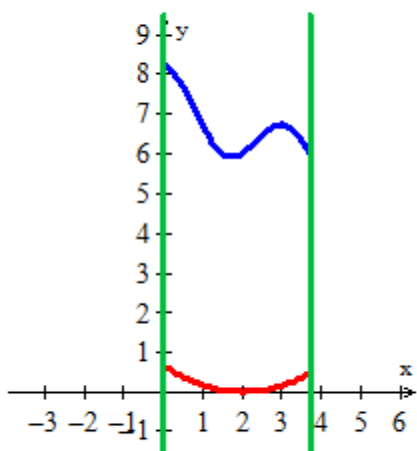
$$g(x) = \frac{1}{6}(x-2)^2$$

Part 2. Find the area of the region bounded by the graphs of $y = 2x^2 - x - 2$ and $y = -x^2 + 2x + 4$.

    (a) Begin by graphing both functions. Find the vertex of each parabola and two additional points to make accurate sketches. Recall that the vertex of a parabola is the extreme point of a quadratic function, so your calculus skills can be used to find the vertices.

    (b) Use algebra to find the intersection points of the two graphs.

    (c) Write the definite integral that will be used to find the area of the bounded region.

    (d) Find the area by evaluating your definite integral.