Practice – 2

Once you feel confident with finding area bounded by a curve and the x-axis, complete problems 1 to 3. Check your answers by going to the Solutions tab in Moodle.

Instructions: Answer each of the following practice questions on a separate piece of paper. Step by step solutions are provided under the Solutions tab. You will learn the material more thoroughly if you complete the questions before checking the answers.

1. Determine the area enclosed by the x-axis, the graph of $y = f(x)$, and the two given vertical lines.

   a. $f(x) = x - 3, x = 2, x = 4$

   b. $f(x) = x^3 - 4x^2, x = -3, x = 3$

   c. $f(x) = \sin\left(\frac{x}{2}\right), x = 0, x = 2\pi$

   d. $f(x) = -2x^2 - 3x + 2, x = -2, x = 1$

2. Determine the area enclosed by the x-axis and the graph of $y = f(x)$.

   a. $f(x) = x^4 - 9x^2$

   b. $f(x) = (x - 2)^2 - 3$

3. Find the exact value of $\int_0^1 \frac{2x}{1 + x^2}\, dx$. For this question, change the limits of integration to perform the integration in terms of u using integration by substitution.