**Problem 1**. * A variable force of $5x^{-2}$ pounds moves an object along a straight line when it is $x$ feet from the origin. Calculate the work done in moving the object from $x = 1$ ft to $x = 10$ ft.

**Problem 2**. When a particle is located at a distance $x$ meters from the origin, a force of $\cos(\pi x/3)$ newtons acts on it. How much work is done in moving the particle from $x = 1$ to $x = 2$? Interpret your answer by considering the work done from $x = 1$ to $x = 1.5$ and from $x = 1.5$ to $x = 2$.

**Problem 3**, If 6 J of work is needed to stretch a spring from 10 cm to 12 cm and another 10 J is needed to stretch it from 12 cm to 14 cm, what is the natural length of the spring?

**Problem 4**. Find the average value of $f$ on the the given interval. Find $c$ in the given interval such that $f(c)$ is the average value of $f$.

    1. * $f(x) = \sqrt{x}$ on $[0, 4]$.

    2. $f(x) = \sqrt[3]{x}$ on $[0, 8]$.

    3. $f(x) = (x - 3)^2$ on $[2, 5]$.