**5.*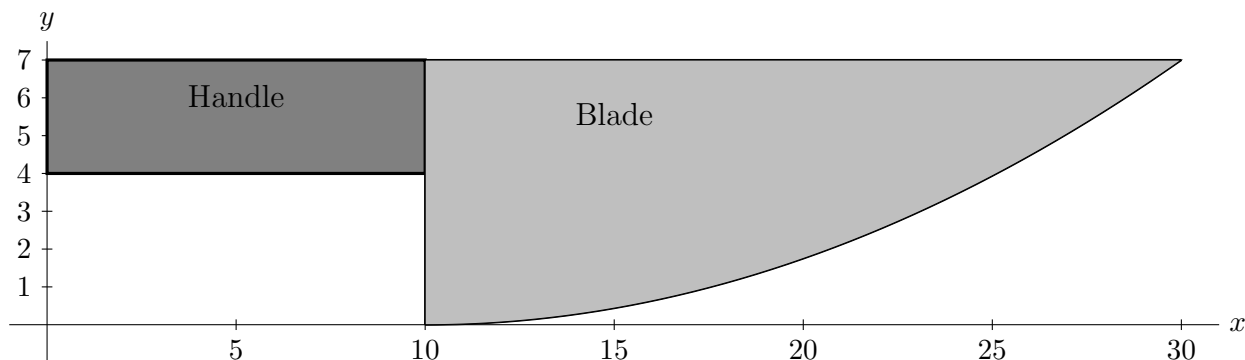* [12 points] Franklin, your robot, goes to the local store and buys a new chef's knife. The handle of the knife is given by the region contained between the lines $y = 7$, $y = 4$, $x = 0$ and $x = 10$. The blade of the knife is in the shape of the region bounded by the line $x = 10$, $y = 7$ and the curve $y = \frac{7(x-10)^2}{400}$. Assume all lengths are in centimeters. Below is a diagram of the knife.

Assume that the density of the knife is constant, with value δ kg/cm^2.

a. [2 points] Find the total mass of the **handle of the knife**. Include units.

b. [4 points] Write an expression involving integrals that gives the total mass of the **blade of the knife**. Do not evaluate any integrals.

c. [2 points] Write an expression involving integrals that gives the x-coordinate of the center of mass of the **blade portion of the knife**. Do not evaluate any integrals.

d. [4 points] Write an expression involving integrals that gives the x-coordinate of the center of mass of the **whole knife** (the blade and handle together). Do not evaluate any integrals.