Problem 9.1 Let $a > 0$ and

$$F(x) = \begin{cases} \pi, & x < a \\ 4 + x - a, & a \le x < 2a \\ 4 + a + (x - a)^2, & x \ge 2a. \end{cases}$$

Sketch the graph of F.

To test your understanding of how a Riemann-Stieltjes integral works, compute

$$\int_0^{3a} x \, dF(x).$$

You should get $\frac{29}{3}a^3 + \frac{3}{2}a^2 + (4 - \pi)a$.