$$a = 3$$
$$b = 7$$
$$f(x) = x^3$$
$$F(x) = \frac{x^3 + 1}{3 + 1} = \frac{x^4}{4}$$
$$x = 3 : F(3) = \frac{3^4}{4} = \frac{81}{4}$$
$$x = 7 : F(7) = \frac{7^4}{4} = \frac{2401}{4}$$
$$\frac{2401}{4} - \frac{81}{4} = \frac{2320}{4} = 580$$
$$\int_a^b f(x)\,dx = 580$$