

Exercise 7

The *beta function* is this function of two real variables:

$$B(p, q) = \int_0^1 t^{p-1}(1-t)^{q-1} dt \quad (p > 0, q > 0).$$

Make the substitution $t = 1/(x+1)$ and use the result obtained in the example in Sec. 84 to show that

$$B(p, 1-p) = \frac{\pi}{\sin(p\pi)} \quad (0 < p < 1).$$