

Exercise 27

Use a table of values to estimate the value of the limit. If you have a graphing device, use it to confirm your result graphically.

$$\lim_{x \rightarrow 0^+} x^x$$

Solution

Evaluate the given function at several values of x .

$$x^x \Big|_{x=0.0001} = 0.999079$$

$$x^x \Big|_{x=0.001} = 0.993116$$

$$x^x \Big|_{x=0.01} = 0.954993$$

$$x^x \Big|_{x=0.1} = 0.794328$$

Therefore,

$$\lim_{x \rightarrow 0^+} x^x = \lim_{x \rightarrow 0^+} e^{\ln x^x} = \lim_{x \rightarrow 0^+} e^{x \ln x} = e^0 = 1.$$

