

Exercise 13

- (a) Find a number δ such that if $|x - 2| < \delta$, then $|4x - 8| < \varepsilon$, where $\varepsilon = 0.1$.
- (b) Repeat part (a) with $\varepsilon = 0.01$.
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Solution

We're looking for a number δ that's greater than $|x - 2|$.

$$|4x - 8| < \varepsilon$$

$$|4(x - 2)| < \varepsilon$$

$$4|x - 2| < \varepsilon$$

$$|x - 2| < \frac{\varepsilon}{4}$$

If $\varepsilon = 0.1$, then choose

$$\delta = \frac{\varepsilon}{4} = \frac{0.1}{4} = 0.025.$$

If $\varepsilon = 0.01$, then choose

$$\delta = \frac{\varepsilon}{4} = \frac{0.01}{4} = 0.0025.$$