

## Exercise 11

For the following exercises, find the average rate of change of each function on the interval specified for real numbers  $b$  or  $h$ .

$$a(t) = \frac{1}{t+4} \text{ on } [9, 9+h]$$

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### Solution

The average rate of change of the function on  $[9, 9+h]$  is

$$\begin{aligned} \frac{a(9+h) - a(9)}{(9+h) - 9} &= \frac{\frac{1}{(9+h)+4} - \frac{1}{(9)+4}}{h} \\ &= \frac{\frac{1}{h+13} - \frac{1}{13}}{h} \\ &= \frac{\frac{13}{13(h+13)} - \frac{h+13}{13(h+13)}}{h} \\ &= \frac{\frac{13-(h+13)}{13(h+13)}}{h} \\ &= \frac{13-h-13}{13h(h+13)} \\ &= \frac{-h}{13h(h+13)} \\ &= -\frac{1}{13(h+13)}. \end{aligned}$$