

# LESSON 1.8 A

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CONTINUITY

# PROBLEM

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Give an example of a function (a formula or a graph is fine)  $y = f(x)$  that is . . . . .

- (a) continuous on  $(-\infty, \infty)$ .
- (b) discontinuous at every integer.
- (c) nowhere continuous.
- (d) continuous on  $(a, b)$  but not  $[a, b]$ .

## PROBLEM

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$$\text{Let } f(x) = \begin{cases} 2x - x^2 & \text{if } 0 \leq x \leq 2 \\ 2 - x & \text{if } 2 < x \leq 3 \\ x - 4 & \text{if } 3 < x < 4 \\ \pi & \text{if } x \geq 4 \end{cases}$$

Discuss the continuity of  $f(x)$  at  $x = 2$ ,  $3$ , and  $4$ .

## PROBLEM

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Determine the value of  $a$  so that

$$f(x) = \begin{cases} x^3, & x \leq 2 \\ ax^2, & x > 2 \end{cases}$$

is continuous on the real number line.