

## 2.6 Group Activity Problems



1. Which of the following functions are continuous for all values in their domain? Justify your answers.
  - a.  $a(t)$  = altitude of a skydiver  $t$  seconds after jumping from a plane
  - b.  $n(t)$  = number of quarters needed to park legally in a metered parking space for  $t$  minutes

Determine whether the following functions are continuous at  $a$ .

19.  $f(x) = \sqrt{x - 2}$ ;  $a = 1$

74.  $g(x) = \begin{cases} \frac{x^3 - 5x^2 + 6x}{x - 2} & \text{if } x \neq 2 \\ -2 & \text{if } x = 2 \end{cases}$ ;  $a = 2$

$$24. f(x) = \begin{cases} \frac{x^2 + x}{x + 1} & \text{if } x \neq -1 \\ 2 & \text{if } x = -1 \end{cases}; a = -1$$

81. Sketch the graph of a function that is continuous on  $(0, 1]$  and on  $(1, 2)$  but is not continuous on  $(0, 2)$ .

87. **An unknown constant** Let

$$g(x) = \begin{cases} x^2 + x & \text{if } x < 1 \\ a & \text{if } x = 1 \\ 3x + 5 & \text{if } x > 1. \end{cases}$$

- Determine the value of  $a$  for which  $g$  is continuous from the left at 1.
- Determine the value of  $a$  for which  $g$  is continuous from the right at 1.
- Is there a value of  $a$  for which  $g$  is continuous at 1? Explain.

**79. Determining unknown constants** Let

$$g(x) = \begin{cases} 5x - 2 & \text{if } x < 1 \\ a & \text{if } x = 1 \\ ax^2 + bx & \text{if } x > 1. \end{cases}$$

Determine values of the constants  $a$  and  $b$ , if possible, for which  $g$  is continuous at  $x = 1$ .