

## SECTION 2-4: CONTINUITY

Read Section 2.4. Work the embedded problems.

1. Determine the point(s), if any, at which each function is discontinuous. Classify any discontinuity as jump, removable, infinite, or other.

(a)  $g(x) = x^{-1} + 1$

(b)  $h(x) = \frac{x+2}{x^2-4}$

(c)  $f(\theta) = \tan(\theta)$

2. Find the value(s) of  $k$  that makes the function continuous over the given interval.

$$f(x) = \begin{cases} e^{kx} & \text{if } 0 \leq x < 4 \\ 2x + 1 & \text{if } 4 \leq x \leq 10 \end{cases}$$

3. Use the Intermediate Value Theorem to show that the equation  $x^4 + x - 3 = 0$  must have a solution in the interval from  $x = 1$  to  $x = 2$ .

4. Sketch the graph of a function  $f(x)$  with the following properties:

- (a) the domain of  $f(x)$  is the interval  $[0, 10]$ .
- (b)  $f(x)$  is continuous except at  $x = 0$  and  $x = 5$ .