

## 2.7 Exercises

1. A curve has equation  $y = f(x)$ .

10.  $y = x/(1 - x)$ ,  $(0, 0)$

the points  $P(3, f(3))$  and  $Q(x, f(x))$ .

(b) Write an expression for the slope of the tangent line at  $P$ .

2. Suppose an object moves with position function  $s = f(t)$ .

11. (a) Find the slope of the tangent to the curve  $y = 2/(x + 3)$  at the point where  $x = a$ .

(b) Find the slopes of the tangent lines at the points whose  $x$ -coordinates are (i)  $-1$ , (ii)  $0$ , and (iii)  $1$ .

in the time interval from  $t = a$  to  $t = a + h$ .

(b) Write an expression for the instantaneous velocity at time  $t = a$ .

3. Consider the slope of the given curve at each of the five points

12. (a) Find the slope of the tangent to the parabola  $y = 1 + x + x^2$  at the point where  $x = a$ .

(b) Find the slopes of the tangent lines at the points whose  $x$ -coordinates are (i)  $-1$ , (ii)  $-\frac{1}{2}$ , and (iii)  $1$ .

17. If a ball is thrown into the air with a velocity of 40 ft/s, its height (in feet) after  $t$  seconds is given by  $y = 40t - 16t^2$ . Find the velocity when  $t = 2$ .
18. If an arrow is shot upward on the moon with a velocity of

measuring the slope of the tangent, estimate the rate of change of the temperature after an hour.

23. (a) Use the data in Example 5 to find the average rate of change of temperature with respect to time