

## 10.3 Finding and Using Taylor Series

Name:

Date:

**P 3.** Using known Taylor series, find the first four nonzero terms of the Taylor series about 0 for  $\cos(\theta^2)$ .

**P 5.** Using known Taylor series, find the first four nonzero terms of the Taylor series about 0 for  $\arcsin x$ .

**P 15.** Expand  $\sqrt{T+h}$  about 0 in terms of  $h/T$ . Give four nonzero terms.

**P 28.** For values of  $y$  near 0, put the following functions in increasing order, using their Taylor expansions.

(a)  $\ln(1 + y^2)$

(b)  $\sin(y^2)$

(c)  $1 - \cos y$

**P 46.** Van der Waal's equation relates the pressure,  $P$ , and the volume,  $V$ , of a fixed quantity of gas at constant temperature  $T$ :

$$\left(P + \frac{n^2a}{V^2}\right)(V - nb) = nRT,$$

where  $a, b, n, R$  are constants. Find the first two nonzero terms of the Taylor series of  $P$  in terms for  $1/V$ .