

Calculus Quest

Your Name:

1. The population of Indiana from 1900 to 2000 is modeled by the function:

$$P(t) = -0.008t^3 + 1.215t^2 - 10.73t + 2609$$

where... P is the population in thousands, and
 t is the year ($t=0$ corresponds to 1900)

The amount of farmland in Indiana for the same period is given by:

$$A(P) = \frac{569000}{P}$$

where...
 A is the area in millions of acres, and
 P is the population in thousands

How quickly was the population increasing with respect to time in 1943?

What was the rate of change of farm area with respect to population in 1965?

What was the rate of change of farm area with respect to time in 1986?

(2-6) Find dy/dx by implicit differentiation.

2. $5y^2 + x^3 = 12$

3. $xy = \frac{x}{y} + 1$

4. $(y - 4x)^4 = x$

5. $xe^y = y - 1$

6. $\sin x - \cos y = \cos x \sin y$

(7-9) Find dy/dx .

7. $y = \cos^{-1}(x^2)$

8. $y = \ln x$

9. $x = t^3 - t$
 $y = \sin(5t)$