Find *dy/dx* using implicit differentiation.

1. $y^3 + x^2 y^5 - x^4 = 27$

2. $x^2 + 2xy = 3y^2$

Use logarithmic differentiation to find the derivative.

3. $f(x) = \dfrac{\sqrt{4x+3}}{(2x-5)^3}$

Differentiate.

4. $f(x) = e^{2x} \ln x$

5. $f(x) = \sqrt{1 - e^{-x}}$

6. $f(x) = \ln\left(\dfrac{x^2 - 7}{x}\right)$

7. $f(x) = x \ln \sqrt[3]{3x + 1}$

8. $f(x) = \left(\dfrac{x^2}{x+5}\right)^4$

9. $f(x) = e^{2\sqrt{x}}$

10. $f(x) = (\ln x)^3$

11. $f(x) = 3e^{4x} - 12e^{-3x}$

12. Find the velocity and acceleration of an object whose position s and time t is given.
$$s = 16t^2 + 10t + 1$$

13. Find y''' if $y = \ln(3x)$