Larson 7.0 Section 2.5 #1-15 odd, #21-31 odd

In Exercises 1–16, find dy/dx by implicit differentiation.

1. $x^2 + y^2 = 36$

2. $x^2 - y^2 = 16$

3. $x^{1/2} + y^{1/2} = 9$

4. $x^3 + y^3 = 8$

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

6. $x^2y + y^2x = -2$

7. $x^3y^3 - y = x$

8. $\sqrt{xy} = x - 2y$

9. $x^3 - 3x^2y + 2xy^2 = 12$

10. $2 \sin x \cos y = 1$

11. $\sin x + 2 \cos 2y = 1$

12. $(\sin \pi x + \cos \pi y)^2 = 2$

13. $\sin x = x(1 + \tan y)$

14. $\cot y = x - y$

15. $y = \sin(xy)$

16. $x = \sec \dfrac{1}{y}$

In Exercises 21–28, find dy/dx by implicit differentiation and evaluate the derivative at the indicated point.
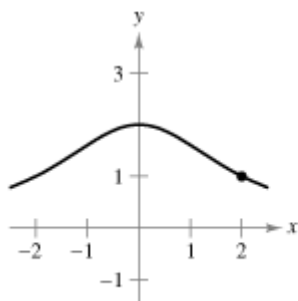
Equation	Point
21. $xy = 4$	$(-4, -1)$
22. $x^2 - y^3 = 0$	$(1, 1)$
23. $y^2 = \dfrac{x^2 - 4}{x^2 + 4}$	$(2, 0)$
24. $(x + y)^3 = x^3 + y^3$	$(-1, 1)$
25. $x^{2/3} + y^{2/3} = 5$	$(8, 1)$
26. $x^3 + y^3 = 4xy + 1$	$(2, 1)$
27. $\tan(x + y) = x$	$(0, 0)$
28. $x \cos y = 1$	$\left(2, \dfrac{\pi}{3}\right)$

In Exercises 29–32, find the slope of the tangent line to the graph at the indicated point.

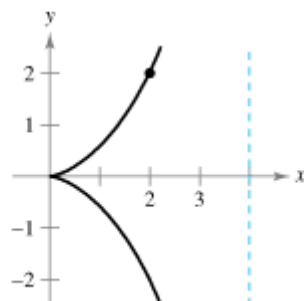29. Witch of Agnesi:

    $(x^2 + 4)y = 8$

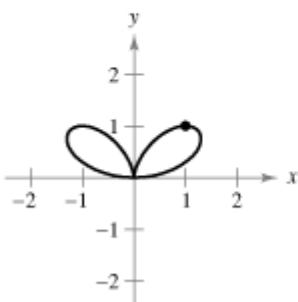   Point: $(2, 1)$

30. Cissoid:

    $(4 - x)y^2 = x^3$

    Point: $(2, 2)$

31. Bifolium:

    $(x^2 + y^2)^2 = 4x^2 y$

    Point: $(1, 1)$

32. Folium of Descartes:

    $x^3 + y^3 - 6xy = 0$

    Point: $\left(\frac{4}{3}, \frac{8}{3}\right)$