H5

A

[Ex 3.1, p155]

In Exercises below, differentiate the functions and find the slope of the tangent line at the given value of the independent variable. Then, sketch the functions.

14. $k(x) = \dfrac{1}{2 + x}, \quad x = 2$

16. $y = (x + 1)^3, \quad x = -2$

B

[Ex 3.2, p169]

In Exercises below, find the first and second derivatives.

1. $y = -x^2 + 3$

3. $s = 5t^3 - 3t^5$

7. $w = 3z^{-2} - \dfrac{1}{z}$

C

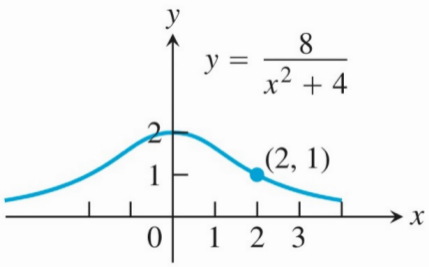
Find the derivatives of all orders of the functions in Exercises 29 and 30.

29. $y = \dfrac{x^4}{2} - \dfrac{3}{2}x^2 - x$

30. $y = \dfrac{x^5}{120}$

D

44. Find the tangent to the *Witch of Agnesi* (graphed here) at the point (2, 1).



E

[Ex 3.3, p179]

10. Lunar projectile motion A rock thrown vertically upward from the surface of the moon at a velocity of 24 m/sec (about 86 km/h) reaches a height of $s = 24t - 0.8t^2$ meters in t sec.

a. Find the rock's velocity and acceleration at time t. (The acceleration in this case is the acceleration of gravity on the moon.)

b. How long does it take the rock to reach its highest point?

c. How high does the rock go?

F

[Ex 3.4, p188]

In Exercises below, find dy/dx.

1. $y = -10x + 3\cos x$

8. $y = \dfrac{\cos x}{1 + \sin x}$

11. $y = x^2 \sin x + 2x \cos x - 2 \sin x$

G

[Ex 3.5, p201]

In Exercises below, given $y = f(u)$ and $u = g(x)$, find $dy/dx = f'(g(x))g'(x)$.

3. $y = \sin u, \quad u = 3x + 1$

4. $y = \cos u, \quad u = -x/3$