

Find the derivative. **Show work in your spiral.**

1)  $f(x) = 2\sqrt{x} + 1$

2)  $f(x) = \frac{2}{3x^2}$

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

4)  $f(x) = \frac{6x-5}{x^2+1}$

5)  $f(x) = x(1-4x^2)^2$

6)  $f(x) = (3x^2+7)(x^2-2x)$

7)  $f(x) = \left(x^2 + \frac{1}{x}\right)^5$

8)  $f(x) = (6x-x^3)^2$

9)  $f(x) = \frac{1}{x^2+3x-1}$

10)  $f(x) = x\sqrt{2x+3}$

11)  $f(x) = \frac{1}{(x^2-3x)^2}$

12)  $h(x) = -3\sqrt[4]{2-9x}$

13)  $f(x) = x\left(1 - \frac{2}{x+1}\right)$

14)  $g(x) = \frac{x^2-2x+5}{\sqrt{x}}$

15)  $g(x) = \sqrt[3]{x}(x+1)$

16)  $f(x) = (3x^3+4x)(x-5)(x+1)$

17)  $d(x) = \sqrt[3]{(x^2+4)^2}$

18)  $f(x) = \left(\frac{3x-1}{x^2+3}\right)^2$

19)  $y = x^2\sqrt{1-x^2}$

Find an equation of the tangent line to the graph of the function at the given point.

20)  $f(x) = (x^2-1)^2$  (-2,9)

21)  $h(x) = \frac{2x+1}{x-1}$  (2,5)

22)  $f(x) = \frac{36}{(3-x)^2}$  (0,4)

23)  $h(x) = (x^2-9)\sqrt{x+2}$  (-1,-8)

24)  $f(x) = \frac{x+1}{\sqrt{2x-3}}$  (2,3)

25)  $s(x) = \frac{2x}{\sqrt{x+1}}$  (3,3)

Find the given value.

26)  $g(x) = 3x^2 + 2x + 5$   $g''(2)$

27)  $c(x) = \sqrt{4-x}$   $c'''(-5)$

Find the 3rd derivative of the function.

28)  $f(x) = \frac{3}{16x^2}$

29)  $w(x) = \frac{3}{4x^2}$

30)  $f(x) = 5x(x+4)^3$

Find the 2nd derivative and solve the equation  $f''(x) = 0$ .

31)  $f(x) = x^3 - 9x^2 + 27x - 27$

32)  $f(x) = x\sqrt{x^2 - 1}$

33)  $f(x) = \frac{x}{x^2 + 3}$

34)  $f(x) = (x+3)(x-4)(x+5)$

35)  $f(x) = 3(2 - x^2)^3$

36)  $f(x) = \frac{x+1}{x-1}$