

WORKSHEET 3.2-4**Find the derivative of each of the following.**

1) $y = 3x^6$

2) $y = 4x^6 + 3x^3 - 6x + 1$

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

4) $y = x\sqrt{x} + \frac{5}{x}$

5) $y = 3\sqrt{x} + \frac{1}{x^2}$

6) $y = (2 - x - 3x^3)(7 + x^5)$

7) $y = (x^3 + 7x^2 - 8)(2x^{-3} + x^{-4})$

8) $y = \left(\frac{1}{x} + \frac{1}{x^2}\right)(3x^3 + 27)$

9) $y = (3x^2 + 1)^2$

10) $y = \frac{5x - 3}{x}$

11) $y = \frac{x^2 + 1}{3x}$

12) $y = \frac{2x - 1}{x + 3}$

13) $y = (2x^7 - x^2)\left(\frac{x-1}{x+1}\right)$

14) $y = 3x^6 + 2x - 1$

15) $y = \frac{1}{5x - 3}$

16) $y = \frac{x^3 - 2}{6}$

17) $y = (3x^2 + 6)(2x - 1)$

18) $y = \frac{3x}{2x + 1}$

19) $y = \frac{1}{(2x + 3)(x - 1)}$

20) $y = \frac{4x + 1}{x^2 - 5}$

21) $y = (x - 2)^{-1}(2x^3 - 1)$

Find the indicated higher order derivative.

22) $y = 5x^2 - 4x + 7$, find y'''

23) $y = x^{-5} + x^5$, find y'''

24) $y = (x^3 - 5)(2x + 3)$, find y''

25) $y = \frac{2x^5}{5} - 6x^2 + 3x - 9$, find all derivatives

Complete the following problems.

26) Find the equation of the tangent to $y = x^2 - 3x + 7$ at $x = 1$.

27) Find the location of the horizontal tangent line(s) of $y = x^3 - 27x + 1$. What are the equations of the line(s)?

28) At which point(s) does the graph of $y = \frac{x}{x^2 + 9}$ have a horizontal tangent line?