

## Keeper 4.1 Virtual Problems – The Power Rule

Differentiate each Function:

1.  $f(x) = e^5$

2.  $f(t) = 2 - \frac{2}{3}t$

3.  $f(x) = \frac{3}{4}x^8$

4.  $h(x) = (x - 2)(2x + 3)$

5.  $g(t) = 2t^{-\frac{3}{4}}$

6.  $A(s) = -\frac{12}{s^5}$

7.  $y = x^{\frac{5}{3}} - x^{\frac{2}{3}}$

8.  $h(t) = \sqrt[4]{t} - 4e^t$

9.  $y = \sqrt{x}(x - 1)$

10.  $y = 3e^x + \frac{4}{\sqrt[3]{x}}$

11.  $y = \frac{x^2+4x+3}{\sqrt{x}}$

12.  $y = \frac{\sqrt{x}+x}{x^2}$

13.  $k(r) = e^r + r^e$

14.  $f(x) = x^3 - 4x + 6$

15.  $f(t) = 1.4t^5 - 2.5t^2 + 6.7$

16.  $g(x) = x^2(1 - 2x)$

17.  $s(p) = \sqrt{p} - p$

18.  $S(r) = 4\pi r^2$

19.  $y = \frac{x^8 + 12x^5 - 4x^4 - 6x + 5}{5}$

20.  $y = \frac{3x^2 - \sqrt{x} + x}{x}$

21.  $u = \sqrt[5]{t} + 4\sqrt{t^5}$

22.  $P = 3M^{\frac{2}{3}}$   
Find  $\frac{dP}{dM} \Big|_{M=8}$

23.  $q(r) = \sqrt{r}(\sqrt{r} + 1)$   
Find  $\frac{dq}{dr} \Big|_{r=9}$

24.  $y = \frac{(x+1)^2}{4x}$   
Find  $y, y', y''$

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

25.  $f(x) = 2x^3 + 6, (-1, 4)$

26.  $y = \sqrt[4]{x}, (1, 1)$

27.  $y = x^4 + 2x^2 - x, (1, 2)$