

## Homework for Day 2, Session 1

For questions 1-18, find the derivative of each function.

1.  $g(t) = 6t^{5/3}$

5.  $W(x) = 3x^2 + \sqrt[3]{x^4}$

2.  $h(z) = 8z^{3/2}$

6.  $T(g) = g^4 - \sqrt[4]{g^3}$

3.  $f(s) = 15 - s + 4s^2 - 5s^4$

7.  $g(x) = (x^3 - 7)(2x^2 + 3)$

4.  $f(t) = 12 - 3t^4 + 4t^6$

8.  $K(x) = (2x^2 - 4x + 1)(6x - 5)$

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9.  $f(x) = x^{1/2}(x^2 + x - 4)$

13.  $p(x) = 1 + \frac{1}{x} + \frac{1}{x^2} + \frac{1}{x^3}$

10.  $H(y) = y^{3/2}(3y^2 - 2y + 5)$

14.  $q(r) = 1 + \frac{3}{r} + \frac{7}{r^2} + \frac{15r}{r^3}$

11.  $h(r) = r^2(3r^4 - 7r + 2)$

15.  $V(r) = \frac{4}{3}\pi r^3$

12.  $F(r) = \frac{r^2 - 4}{r + 2}$

16.  $M(x) = \frac{2x^3 - 7x^2 + 4x + 3}{x^2}$

AP Physics Prep  
Homework for Day 2, Session 1

Name: \_\_\_\_\_ Date: \_\_\_\_\_

17.  $T(z) = \frac{5z^4 + z^3 - 2z}{z^3}$

18.  $y = \frac{x^2 - 3x}{\sqrt[3]{x^2}}$

19. Use the function  $f(x)$  to answer the following questions

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

- a) Find the value of  $f(4)$ .
  
  
  
  
  
  
  
  
  
  
- b) Find the slope of the line tangent to  $f(x)$  at  $x = 4$ .
  
  
  
  
  
  
  
  
  
  
- c) Find the equation of the line tangent to  $f(x)$  at  $x = 4$ .

20. A weather balloon rises vertically such that its distance  $y(t)$  above the ground during the first 10 seconds of flight is given by the equation

$$y(t) = 6 + 2t + t^2$$

where  $y$  is in meters and  $t$  is in seconds.

- a) Find the velocity of the balloon at  $t = 1$
  
  
  
  
  
  
  
  
  
  
- b) Find the velocity of the balloon when it is 25 m above the ground.