

Calculus I Test # 1b Review**Prof.G.Buthusiem**

13. Find the derivative of the function.

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

14. Find the derivative of the function $f(x) = \frac{x^7 - 4}{x^6}$.

15. Differentiate $f(s) = \sqrt{s}(3 - s^4)$.

16. Differentiate. $P(v) = v^{-4} \cos v$

17. Differentiate the function $f(t) = \frac{6t}{t^3 + 5}$.

18. Find the derivative of the function $f(x) = 9\sqrt{x} \sin(x)$.

19. Find the second derivative of the function $f(x) = 2x^{\frac{7}{5}}$.

20. Suppose the position function for a free-falling object on a certain planet is given by $s(t) = -14t^2 + v_0t + s_0$. A silver coin is dropped from the top of a building that is 1360 feet tall. Find velocity of the coin at impact. Round your answer to the three decimal places.

21. Find the derivative of the function.

$$f(t) = (4 + 7t)^{\frac{2}{5}}$$

22. Find the derivative of the function.

$$g(x) = \left(\frac{x+2}{x^2+5} \right)^8$$

23. Evaluate the derivative of the function $f(t) = \frac{2t^2 + 3}{2t - 1}$ at the point $\left(3, \frac{21}{5} \right)$.

24. Find dy/dx by implicit differentiation.

$$x^2 + y^2 = 4$$

25. Find dy/dx by implicit differentiation.

$$x^2 + 10x + 9xy - y^2 = 36$$

26. Assume that x and y are both differentiable functions of t . Find

$$\frac{dx}{dt} \text{ when } x = 5 \text{ and } \frac{dy}{dt} = -4 \text{ for the equation } xy = 15.$$

27. The radius, r , of a circle is decreasing at a rate of 4 centimeters per minute.

Find the rate of change of area, A , when the radius is 4.

28. A spherical balloon is inflated with gas at the rate of 700 cubic centimeters per minute. How fast is the radius of the balloon increasing at the instant the radius is 70 centimeters?

13. $f'(x) = -\frac{3}{x^4}$
14. $f'(x) = 1 + \frac{24}{x^7}$
15. $f'(s) = -4s^{7/2} + \frac{3-s^4}{2\sqrt{s}}$
16. $P'(v) = -v^{-4} \sin v - 4v^{-5} \cos v$
17. $f'(t) = -\frac{6(-5+2t^3)}{(t^3+5)^2}$
18. $\frac{9}{2\sqrt{x}} \sin(x) + 9\sqrt{x} \cos(x)$
19. $f''(x) = \frac{28}{25} x^{-3/5}$
20. -275.971 ft/sec
21. $f'(t) = \frac{14}{5} (4+7t)^{-3/5}$
22. $g'(x) = \frac{8(5-4x-x^2)(2+x)^7}{(5+x^2)^9}$
23. $f'(3) = \frac{18}{25}$
24. $\frac{dy}{dx} = -\frac{x}{y}$
25. $\frac{dy}{dx} = \frac{2x+10+9y}{2y-9x}$
26. $\frac{dx}{dt} = \frac{20}{3}$
27. $\frac{dA}{dt} = -32\pi \text{ sq cm/min}$
28. $\frac{dr}{dt} = \frac{1}{28\pi} \text{ cm/min}$