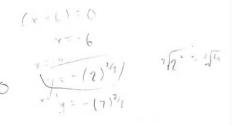
Calculus Individual Test -

BC

 $y = -(x+6)^3$ $y = -(x+6)^3$ 1) Find the y-value of the absolute maximum for the function $y = -(x+6)^{\frac{1}{3}}$ on the interval [-4, 1]



2) Find the equation of the line tangent to the graph of $y = \frac{1}{5x^4 + 5}$ at the point $\left(1, \frac{1}{10}\right)$.

$$y = -(s_{y} + s)^{-1} (70x^{3})$$

$$y' = M_{1}(s_{y} + s)^{-1} (70x^{3})$$

$$y'' = (s + s)^{-1} (70x^{3})$$

3) Use implicit differentiation to find $\frac{dy}{dx}$ at (2, -1).

$$\frac{d}{dx} \left(5 = 5x^2 + 3x^2y + 3y \right)$$

$$0 = 10x + 3\left(x^2 \frac{dy}{dy} + 2xy \right) + 3\frac{dy}{dx}$$

$$\frac{dy}{dx} \left(3x^2 + 3 \right) = -10x - 6xy$$

$$\frac{dy}{dx} \left(-\frac{10x - 6xy}{3x^2 + 3} \right) = -20 + 6(2)(41) = -\frac{8}{3}$$

- $\int_{0}^{3} (4x^{2} + 4)^{2} dx \, 3\int_{0}^{2} dx \, 3\int_{0}^{2}$

$$y = 3\sqrt{x}, \ y = -3\sqrt{x}, \ \int_{c}^{4} \left(3\sqrt{x} + 3\sqrt{x}\right) dx$$

$$x = 0, \ x = 4$$

$$\left(\int_{c}^{4} x^{3/2} dx\right) dx = \left(\int_{c}^{2} \left(4\right)^{3/2} - 0\right)$$

$$= 4\left(\frac{2}{6}4\right) - 4(7) = 32$$

6) A spherical snowball melts at a rate of $\frac{32\pi}{3}$ in³/sec. At what rate is the radius of the

A spherical showball melts at a rate of
$$\frac{1}{3}$$
 in 7sec. At what rate is the radius of the snowball changing when the radius is 4 in? Include units. $\frac{32\pi}{3} = 4\pi (4)^3 dx^{32\pi} = 4$

7) Approximate the area under the curve over the interval [-2, 2] using 2^6 midpoint rectangles.

$$y = x^{2} + x + 1$$

$$4 = -7$$

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$$7 = 3$$

$$7 = 6$$

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8) Find

9) If
$$F(x) = \int_{x}^{2x} (t^3 - 2t^2 + 1) dt$$
 then find and simplify $F'(x)$

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0) For the function $y = 2x^2 - 12x + 17$, where does the instantaneous rate of change equal the average 4x-12=2 4x=14 X= 14= 2 rate of change on the interval [2, 5]

11) Find the volume of the solid that results when the region enclosed by the curves is revolved about the

x-axis.

$$y = \sqrt[3]{x}, \ y = 0, \ x = 1$$

$$\int_{0}^{\infty} \left(\sqrt[3]{x} \right)^{2} dx$$

 $\int \frac{\ln x}{\sqrt{x}} dx \quad u = \ln x \quad dv = (x^{-1/2})$ 1.2) Find 2x" |ny - [2x" [2] | 7x" |ny - 2[2x 32] 1

13) Consider the curve defined on the interval [0.2π) by the parametric equations

$$x(t) = \cos 3t$$

$$y(t) = 3\sin 2t$$

$$x'(t) = -3\sin (2\pi) = -35\pi$$

$$y'(t) = -3\sin (2\pi) = -35\pi$$

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Find the slope of the line tangent to the curve when $t = \frac{\pi}{4}$

14) Find the Average Value of the function over the interval [2, 5]

$$f(x) = \frac{4}{x} \qquad \frac{\int_{x}^{3} \frac{4}{x} dx}{5.-7}$$

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$$\frac{\int_{x}^{3} \frac{4}{x} dx}{4 \ln 5 - 4 \ln 7}$$

15) If a particle's position is defined by the vector valued function $< \cos 3t$, $6t^4 - e^{2t} >$ particle's acceleration vector when t = 0v(t) = -3sin3t, 24t3-2e1t

$$a(t) = -9\cos 3t, 72t^{2} - 4e^{2t}$$

$$a(0) = -9\cos 3t, 4$$

$$= -9\cos 4$$