

Name _____ B

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the slope of the line tangent to the graph at the given point.

- 1) $y = \frac{6}{3 + x^2}, x = 7$ 1) _____
 A) $m = -\frac{3}{50}$ B) $m = -\frac{3}{5}$ C) $m = \frac{3}{5}$ D) $m = \frac{3}{50}$

Find the second derivative.

- 2) $y = \frac{23x^3}{6} - 8$ 2) _____
 A) $23x$ B) $\frac{23}{6}x$ C) $\frac{23}{2}x^2$ D) $23x - 8$

Solve the problem.

- 3) The number of gallons of water in a swimming pool t minutes after the pool has started to drain is $(t) = 50(20 - x)^2$. How fast is the water running out at the end of 15 minutes?
 A) 1250 gal/min B) 625 gal/min C) 250 gal/min D) 500 gal/min 3) _____

Find the second derivative of the function.

- 4) $y = \frac{(x - 8)(x^2 + 3x)}{x^3}$ 4) _____
 A) $\frac{d^2y}{dx^2} = -\frac{10}{x^3} - \frac{144}{x^2}$ B) $\frac{d^2y}{dx^2} = -\frac{10}{x^3} - \frac{144}{x^4}$
 C) $\frac{d^2y}{dx^2} = \frac{5}{x^2} + \frac{48}{x^3}$ D) $\frac{d^2y}{dx^2} = \frac{10}{x^3} + \frac{144}{x^4}$

Find the derivative.

- 5) $y = \frac{10}{x} + 5 \sec x$ 5) _____
 A) $y' = -\frac{10}{x^2} + 5 \sec x \tan x$ B) $y' = \frac{10}{x^2} - 5 \sec x \tan x$
 C) $y' = -\frac{10}{x^2} + 5 \tan^2 x$ D) $y' = -\frac{10}{x^2} - 5 \csc x$

Solve the problem.

- 6) Find the tangent to $y = 2 - \sin x$ at $x = \pi$. 6) _____
 A) $y = x - 2$ B) $y = -x + 2$ C) $y = -x + \pi - 2$ D) $y = x - \pi + 2$

Find the indicated derivative.

- 7) Find y'' if $y = 6x \sin x$. 7) _____
 A) $y'' = -12 \cos x + 6x \sin x$ B) $y'' = 6 \cos x - 12x \sin x$
 C) $y'' = 12 \cos x - 6x \sin x$ D) $y'' = -6x \sin x$

Suppose that the functions f and g and their derivatives with respect to x have the following values at the given values of x . Find the derivative with respect to x of the given combination at the given value of x .

8) $\frac{x|f(x) \ g(x) \ f'(x) \ g'(x)|}{3B \ 1 \ 9 \ 6B \ 3B}$ 8) _____
 $\frac{4B \ 3 \ 3B \ 2B \ -6B}{}$

$\sqrt{f(x) + g(x)}, x = 3B$

A) $\frac{1}{2\sqrt{10B}}$

) $\frac{9}{2\sqrt{10B}}$

) $\frac{9}{\sqrt{10B}}$

D) $-\frac{1}{2\sqrt{10B}}$

Find the derivative of the function.

9) $h(x) = \left(\frac{\cos x}{1 + \sin x}\right)^5$ 9) _____

A) $5\left(\frac{\cos x}{1 + \sin x}\right)^4$

B) $\frac{-5 \cos^4 x}{(1 + \sin x)^5}$

) $\left(-\frac{4 \sin x}{\cos x}\right)\left(\frac{\cos x}{1 + \sin x}\right)^4$

D) $-5\left(\frac{\sin x}{\cos x}\right)^4$

Find dy/dt .

10) $y = t^4(t^5 - 9)^5$ 10) _____

A) $t^4(t^5 - 9)^4(29t^4 - 36)$

B) $t^3(t^5 - 9)^4(29t^5 - 36)$

) $4t^3(t^5 - 9)^4(25t^5 - 9)$

D) $100t^{18}(t^5 - 9)^4$

Find $\frac{2y}{x} \frac{dy}{dx}$ for the given function.

11) $y = \sqrt[3]{9x + 6}$ 11) _____

A) $-\frac{1}{4(9x + 6)^{3/2}}$

B) $\frac{9}{2\sqrt[3]{9x + 6}}$

) $-\frac{81\sqrt[3]{9x + 6}}{4B}$

D) $-\frac{81}{4(9x + 6)^{3/2}}$

Solve the problem.

12) The position of a particle moving along a coordinate line is $s = \sqrt{2 + 2t}$ with s in meters and t in seconds. Find the particle's acceleration at $t = 1$ sec. 12) _____

A) $-\frac{1}{16} \text{ m/sec}^2$

B) $\frac{1}{2} \text{ m/sec}^2$

) $\frac{1}{8} \text{ m/sec}^2$

D) $-\frac{1}{8} \text{ m/sec}^2$