Exam

Name_____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Provide an appropriate response.

1) If $y = 4u^2 - 13u + 3$ and $u = 7x^3 + 5x^2 + 4x - 14$, then by direct use of the chain rule find $\frac{dy}{dx}$ and evaluate when $x = 1$. 1) _____

2) If $y = 3u^3 - 2u^2 - 5u - 6$ and $u = 4x^2 - 2x - 13$, then by direct use of the chain rule find $\frac{dy}{dx}$ and evaluate when $x = 2$. 2) _____

3) If $y = (6u^2 - 7)^3$ and $u = (9 - 2x)^5$, then by direct use of the chain rule find $\frac{dy}{dx}$ and evaluate when $x = 5$. 3) _____

4) Find y' if $y = 5(2x^2 - 3x + 4)^8$. 4) _____

5) Find y' if $y = \sqrt[4]{(2x + 5)^3}$. 5) _____

6) Find y' if $y = \left(\frac{x + 2}{x - 3}\right)^4$. 6) _____

7) Find the slope of the curve $y = (x^2 + 2x - 2)^4$ at the point (0,16). 7) _____

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

8) If $y = x\sqrt{4x + 3}$, then $\frac{dy}{dx} =$ 8) _____

A) $(4x + 1)\sqrt{4x + 3}$.

B) $\frac{2}{2\sqrt{4x + 3}}$.

C) $\frac{x}{2\sqrt{4x + 3}} + \sqrt{4x + 3}$.

D) $\frac{x}{2\sqrt{4x + 3}} - \sqrt{4x + 3}$.

E) $\frac{2x}{\sqrt{4x + 3}} + \sqrt{4x + 3}$.

9) An equation of the tangent line to the curve $y = \sqrt{x^2 - 9}$ at the point where $x = 5$ is 9) _____

A) $y = \frac{5}{4}x + \frac{9}{4}$.

B) $y = \frac{1}{4}x + \frac{11}{4}$.

C) $y = \frac{5}{4}x - \frac{9}{4}$.

D) $y = 2x - 6$.

E) $y = 2x + 6$.

10) If $g(x) = x^4(2x - 1)^{10}$, then $g'(1) =$ 10) _____

A) 1. B) 24. C) 80. D) 0. E) 14.

11) If $y = u^5 - 8u^2 + 2u - 1$ and $u = \sqrt{x + 10}$, find $\frac{dy}{dx}$ when $x = -9$. 11) _____

A) -1 B) -9 C) 1 D) 0 E) $-\frac{9}{2}$

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

12) 12) _____

If $y = \left(\frac{t - 2}{t - 7}\right)^5$, find $\frac{dy}{dt}$.

13) 13) _____

Find $\frac{dy}{dx}$ where $y = \sqrt[7]{9x^3 - 8x + 5}$.

14) If the cost function for a manufacturer's product is given by $C = \frac{7q^2}{\sqrt{q^2 + 1} + 100}$, find the 14) _____

marginal cost function.

15) 15) _____

Find the equation of the tangent line to the graph of the curve $y = \sqrt[7]{(x^2 - 8)^3}$ at the point (3, 1).

16) The revenue R from the sale of x units of a product is $R = \frac{5}{x} + 50x$. The number of units 16) _____

sold after t weeks of advertising is $x = 48 + \frac{12}{t}$. Find $\frac{dR}{dt}$ when $t = 4$.

17) The revenue R from the sale of x units of a product is $R = \frac{2}{x} + 10x$. The number of units 17) _____

sold after t weeks of advertising is $x = 7 + \frac{12}{t}$. Find $\frac{dR}{dt}$ when $t = 3$.

18) The revenue R from the sale of x units of a product is $R = \frac{3}{x} + 20x$. The number of units sold after t weeks of advertising is $x = 9 + \frac{122}{t}$. Find $\frac{dR}{dt}$ when $t = 2$. 18) _____

Answer Key
Testname: UNTITLED4

1) $(8u - 13)(21x^2 + 10x + 4)$; 105
2) $(9u^2 - 4u - 5)(8x - 2)$; 112
3) $-360u(6u^2 - 7)^2(9 - 2x)^4$; 360
4) $40(4x - 3)(2x^2 - 3x + 4)^7$
5) $\frac{3}{2}(2x + 5)^{-1/4}$
6) $-\frac{20(x + 2)^3}{(x - 3)^5}$
7) -64
8) E
9) C
10) B
11) E
12) $-\frac{25(t - 2)^6}{(t - 7)^8}$
13) $\frac{1}{7}(9x^3 - 8x + 5)^{-6/7}(27x^2 - 8)$
14) $\frac{(\sqrt{q^2 + 1} + 100)(14q) - 7q^2 \frac{1}{2\sqrt{q^2 + 1}} 2q}{(\sqrt{q^2 + 1} + 100)^2}$
15) $y = \frac{18}{7}x - \frac{47}{7}$
16) -37.50
17) -13.31
18) -609.98