

## The Chain Rule

**SHORT ANSWER:** Show your steps & identify the rules you use. No more than two steps to simplify after you have taken the derivative

- 1) Find  $y'$  if  $y = \frac{1}{(2-3x)^4}$ . 1) \_\_\_\_\_
- 2) 2) \_\_\_\_\_  
Find  $y'$  if  $y = \frac{1}{\sqrt[3]{4x^2-3}}$ .
- 3) Find  $y'$  if  $y = \sqrt{\sqrt{x}+1}$ . 3) \_\_\_\_\_
- 4) Find  $y'$  if  $y = x^2(2x-5)^5$ . 4) \_\_\_\_\_
- 5) Find  $y'$  if  $y = (x^2+9)\sqrt{x^2+4}$ . 5) \_\_\_\_\_
- 6) 6) \_\_\_\_\_  
Find  $y'$  if  $y = \left(\frac{x+2}{x-3}\right)^4$ .
- 7) If  $f(x) = (x+1)^2(x+2)^3$ , then  $f'(x) =$  7) \_\_\_\_\_

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

- 8) An equation of the tangent line to the curve  $y = \sqrt{x^2-9}$  at the point where  $x = 5$  is 8) \_\_\_\_\_  
 A)  $y = 2x - 6$ .  
 B)  $y = \frac{1}{4}x + \frac{11}{4}$ .  
 C)  $y = 2x + 6$ .  
 D)  $y = \frac{5}{4}x + \frac{9}{4}$ .  
 E)  $y = \frac{5}{4}x - \frac{9}{4}$ .
- 9) If  $g(x) = x^4(2x-1)^{10}$ , then  $g'(1) =$  9) \_\_\_\_\_  
 A) 80.                      B) 24.                      C) 14.                      D) 0.                      E) 1.
- 10) If  $y = u^5 - 8u^2 + 2u - 1$  and  $u = \sqrt{x+10}$ , find  $\frac{dy}{dx}$  when  $x = -9$ . 10) \_\_\_\_\_  
 A) 1                      B)  $-\frac{9}{2}$                       C) 0                      D) -9                      E) -1

## Answer Key

Testname: 5701-CHAIN RULE1

1)  $\frac{12}{(2-3x)^5}$

2)  $-\frac{8}{3}x(4x^2-3)^{-4/3}$

3)  $\frac{1}{4\sqrt{x}\sqrt{\sqrt{x}+1}}$

4)  $2x(7x-5)(2x-5)^4$

5)  $\frac{x(x^2+9)}{\sqrt{x^2+4}} + 2x\sqrt{x^2+4}$

6)  $-\frac{20(x+2)^3}{(x-3)^5}$

7)  $(x+1)(x+2)^2(5x+7)$ .

8) E

9) B

10) B