

# Classroom Voting Questions: Calculus I

## 3.4 The Chain Rule

1.  $\frac{d}{dx}(x^2 + 5)^{100} =$

- (a)  $100(x^2 + 5)^{99}$
- (b)  $100x(x^2 + 5)^{99}$
- (c)  $200x(x^2 + 5)^{99}$
- (d)  $200x(2x + 5)^{99}$

2.  $\frac{d}{dx}e^{3x} =$

- (a)  $3e^{3x}$
- (b)  $e^{3x}$
- (c)  $3xe^{3x}$
- (d)  $3e^3$

3.  $\frac{d}{dx}\sqrt{1-x} =$

- (a)  $\frac{1}{2}(1-x)^{-1/2}$
- (b)  $-\frac{1}{2}(1-x)^{-1/2}$
- (c)  $-(1-x)^{-1/2}$
- (d)  $-\frac{1}{2}(1-x)^{1/2}$

4.  $\frac{d}{dx}e^{x^2} =$

- (a)  $x^2e^{2x}$
- (b)  $x^2e^{x^2}$
- (c)  $2xe^{x^2}$
- (d)  $xe^{x^2}$

5.  $\frac{d}{dx}3^{4x+1} =$

- (a)  $4 \cdot 3^{4x+1} \ln 4$

- (b)  $4 \cdot 3^{4x+1} \ln 3$
- (c)  $(4x + 1) \cdot 3^{4x+1} \ln 3$
- (d)  $(4x + 1) \cdot 3^{4x+1} \ln 4$

6.  $\frac{d}{dx} (e^x + x^2)^2 =$

- (a)  $2(e^x + x^2)$
- (b)  $2(e^x + 2x)(e^x + x^2)^2$
- (c)  $2(e^x + x^2)^2$
- (d)  $2(e^x + 2x)(e^x + x^2)$

7.  $\frac{d}{dx} x^2 e^{-2x} =$

- (a)  $x^2 e^{-2x} - 2x^2 e^{-2x}$
- (b)  $2x e^{-2x} - x^2 e^{-2x}$
- (c)  $2x e^{-2x} - 2x^2 e^{-2x}$
- (d)  $-2x^2 e^{-2x}$

8.  $\frac{d}{dx} 3^{e^{2x}} =$

- (a)  $2e^{2x} 3^{e^{2x}} \ln 3$
- (b)  $2e^{2x} 3^{e^{2x}}$
- (c)  $2 \cdot 3^{e^{2x}} \ln 3$
- (d)  $e^{2x} 3^{e^{2x}} \ln 3$
- (e)  $2 \cdot 3^{e^{2x}}$

9. If  $\frac{dy}{dx} = 5$  and  $\frac{dx}{dt} = -2$  then  $\frac{dy}{dt} =$

- (a) 5
- (b) -2
- (c) -10
- (d) cannot be determined from the information given

10. If  $\frac{dz}{dx} = 12$  and  $\frac{dy}{dx} = 2$  then  $\frac{dz}{dy} =$

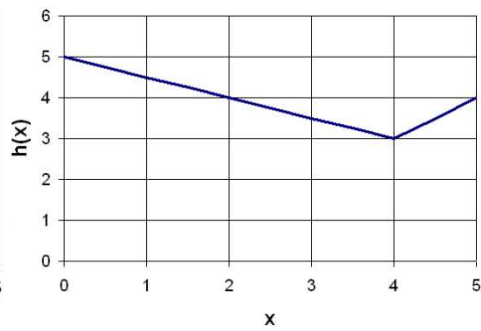
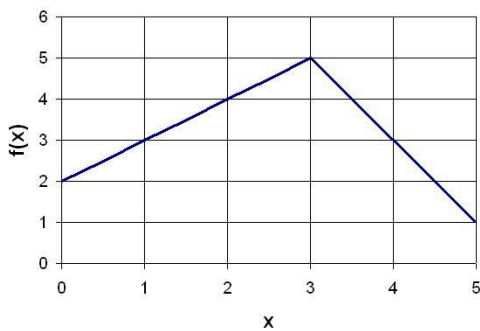
- (a) 24

- (b) 6
- (c)  $1/6$
- (d) cannot be determined from the information given

11. If  $y = 5x^2$  and  $\frac{dx}{dt} = 3$ , then when  $x = 4$ ,  $\frac{dy}{dt} =$

- (a) 12
- (b) 80
- (c) 120
- (d)  $15x^2$
- (e) cannot be determined from the information given

12. The functions  $f(x)$  and  $h(x)$  are plotted below. The function  $g(x) = f(h(x))$ . What is  $g'(2)$ ?



- (a)  $g'(2) = -\frac{1}{2}$
- (b)  $g'(2) = 1$
- (c)  $g'(2) = 3$
- (d)  $g'(2) = 4$
- (e)  $g'(2)$  is undefined