

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) $23^{e^{2x}} \ln 3$
- (d) $e^{2x} 3^{e^{2x}} \ln 3$
- (e) $23^{e^{2x}}$

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 $\frac{dz}{dy} =$

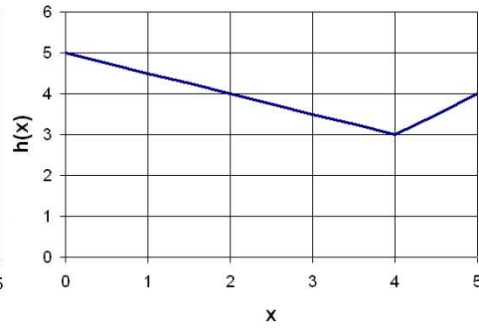
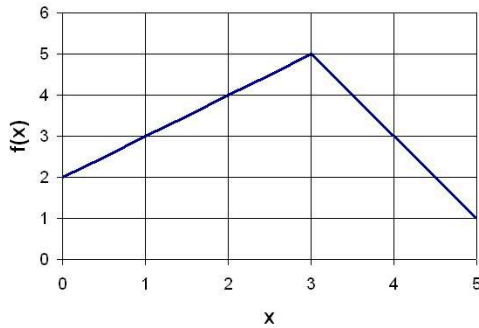
- (a) 24

- (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