

Calculus quiz

Answers

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1. $y = 7e^x$

$$(7)'(e^x) + (7)(e^x)' = 0 + 7e^x = 7e^x //$$

2. $y = \frac{2e^x}{5}$ $(\frac{2}{5})' \cdot e^x + \frac{2}{5} \cdot e^x = \frac{2}{5}e^x //$

3. $y = e^{x^2+4} = y = e^{2x+4} \cdot 4x //$

4. $y = e^{x^2+5} = e^{2x+5} \cdot 4x //$

5. $y = e^{a-5x} = e^{a-5x} \cdot -5 //$

6. $y = e^{-q^3+6q-1} = e^{-2q^3+6q-1} \cdot 3q^2+6 //$

7. $y = e^{3x^2+4x+4} = e^{3x^2+4x+4} \cdot 6x+4 //$

8. $y = e^{9x^2+5x^3-6} = e^{9x^2+5x^3-6} \cdot 18x+15x^2 //$

9. $y = x e^x = 1'(e^x) + x(e^x)' = e^x + x e^x //$

10. $y = x^2 e^x = 2x'(e^x) - x^2(e^x)' //$

11. $x^2 e^{-x^2} = 2x \cdot e^{-x^2} + x^2 \cdot e^{-x^2} \cdot -2x \quad y = 2x \cdot e^{-x^2} - 2x^3 \cdot e^{-x^2} //$

12. $y = x e^{3x} = 1 \cdot e^{3x} + x \cdot e^{3x} \cdot 3 //$

13. $y = \frac{e^x + e^{-x}}{3} = \frac{1}{3}(e^x + e^{-x}) = y = \frac{1}{3}(e^x - e^{-x}) //$

14. $y = \frac{e^x - e^{-x}}{2} = \frac{1}{2}(e^x - e^{-x} \cdot (-1)) = y = \frac{1}{2}(e^x + e^{-x}) //$

15. $y = 4^{3x^2} = y' = 4^{3x^2} \cdot \ln 4 \cdot (3x^2)' \quad y' = 4^{3x^2} \cdot \ln 4 \cdot 6x //$

$$16. y = 2^x x^2 = y = 2^x \cdot \ln 2 \cdot 1(x^2) + 2^x (2x) y = 2^x \cdot \ln 2 \cdot 1$$

$$17. f(w) = \frac{e^{2w}}{w^2} \quad \frac{e^{2w} \cdot 2(w^2) - e^{2w}(2w)}{(w^2)^2}$$

$$\frac{2e^{2w}(w) - e^{2w}(2w)}{w^4}$$

$$18. y = e^{x-\sqrt{x}} = e^{x-\sqrt{x}} \cdot 1 - \frac{1}{2} x^{-\frac{1}{2}} = e^{x-\sqrt{x}} - 1 - \frac{1}{2\sqrt{x}}$$

$$19. y = e^{1+\sqrt{x}} = y = e^{1+\sqrt{x}} \cdot 1 + x^{\frac{1}{2}} \cdot \frac{1}{2} = \frac{1}{2}$$

$$y = e^{1+\sqrt{x}}$$

$$y = e^{1+\sqrt{x}} \cdot \frac{1}{2\sqrt{x}}$$

$$y = e^{1+\sqrt{x}} \cdot x^{\frac{1}{2}}$$

$$20. y = (e^{3x} + 1)^4 = e^{12x} + 1 \quad y' = e^{12x} \cdot 12$$

$$21. y = x^5 - 5^x = 5x^4 - (5^x)(\ln 5)$$

$$22. f(z) = e^{1/z} = \frac{(1)'(z) - (z)'(1)}{z^2} = \frac{0 - 1}{z^2} = -\frac{1}{z^2} = e^{1/z} \cdot \frac{-1}{z^2}$$

$$23. y = \frac{e^x - 1}{e^x + 1} = y' = \frac{(e^x(1) - 0)(e^x + 1) - (e^x - 1)((e^x)(1) + 0)}{(e^x + 1)^2}$$

$$= \frac{e^x(e^x + 1) - (e^x - 1)(e^x)}{(e^x + 1)^2}$$

$$= \frac{e^x - (e^x - 1)(e^x)}{(e^x + 1)^2}$$

$$24. y = e^{2x}(x+6) = (e^{2x}(2))(x+6) + e^{2x}(1+0)$$

$$(e^x(2))(x+6) + e^{2x}$$

$$25. y = e^{\ln x} = (e^{\ln x})(\ln x)' = e^{\ln x} \left(\frac{(x)'}{(x)} \right) (e^{\ln x})(x)$$

$$26. y = e^x \ln x = e^x(-1) \ln x + e^x \left(\frac{1}{x} \right)$$

$$27. y = e^{x \ln x} = e^{x \ln x} ((1) \ln x + x \cdot \frac{1}{x})$$

$$28. \ln e^{4x+1} = (4x+1) \ln e = y' = 4(1) = y' = 4$$