Unit 5 Quiz 1 Review

Name: _____ **Date:** _____

1. If $y = e^{1/x}$, then $y' =$

   A. $-\dfrac{e^{1/x}}{x^2}$ B. $\ln\left(\dfrac{1}{x}\right)$

   C. $\dfrac{e^{1/x}}{x}$ D. $xe^{1/x}$

2. Find y' given $y = e^{\sin\sqrt{x}}$.

   A. $\dfrac{\cos\sqrt{x}}{2\sqrt{x}}e^{\sin\sqrt{x}}$ B. $(\cos\sqrt{x})e^{\sin\sqrt{x}}$

   C. $\dfrac{e^{\cos\sqrt{x}}}{2\sqrt{x}}$ D. $\dfrac{(\sin\sqrt{x})e^{\sin\sqrt{x}}}{\sqrt{x}}$

3. If $y = \ln(e^{2x^2} + 1)$, then $\dfrac{dy}{dx} =$

   A. $\dfrac{xe^{2x^2}}{e^{2x^2}+1}$ B. $\dfrac{4xe^{x^2}}{e^{2x^2}+1}$

   C. $\dfrac{4xe^{2x^2}}{e^{2x^2}+1}$ D. $\dfrac{4x^2e^{x^2}}{e^{2x^2}+1}$

4. Find $\dfrac{dy}{dx}$ given $y = \ln(5-x)^6$.

   A. $\dfrac{6}{x-5}$ B. $-6(5-x)^5$

   C. $6(5-x)^5$ D. $-\dfrac{1}{5-x}$

5. Find $\dfrac{dy}{dx}$ for $y = \ln\sqrt{x^2+4}$.

   A. $\dfrac{x}{\sqrt{x^2+4}}$ B. $\dfrac{x}{x^2+4}$

   C. $\dfrac{1}{x}$ D. $e^x \cdot e^{x^2+4}$

6. Find the derivative of $f(x) = \ln\dfrac{\sqrt{x^2+1}}{x(2x^3-1)^2}$.

   A. $\dfrac{x}{x^2+1} - \dfrac{1}{x} + \dfrac{12x^2}{2x^3-1}$

   B. $\dfrac{x}{x^2+1} - \dfrac{1}{x} + \dfrac{6x^2}{2x^3-1}$

   C. $\dfrac{x}{x^2+1} - \dfrac{1}{x} - \dfrac{12x^2}{2x^3-1}$

   D. $\dfrac{2x}{x^2+1} - \dfrac{1}{x} + \dfrac{6x^2}{x^3-1}$

7. If $y = 9^{-x}$, then $\dfrac{dy}{dx} =$

A. $3^{-2x} \ln 3$
B. $3^{-2x} 2 \ln 3$
C. $3^{-x} 2 \ln 3$
D. $(-2)3^{-2x} \ln 3$

8. If $y = 3^{2x^2-5x}$, then $\dfrac{dy}{dx} =$

A. $(2x^2 - 5x)(3^{2x^2-5x-1})$
B. $4x(3^{2x^2-5x}) \ln 3$
C. $(4x - 5)e^3(3^{2x^2-5x})$
D. $(4x - 5)(3^{2x^2-5x}) \ln 3$

9. Let $y = 3^x x^3$. Find $\dfrac{dy}{dx}$.

A. $3^x x^2[3 + (\ln 3)x]$
B. $3^{x-1} x^2[9 + x^2]$
C. $9x^2$
D. $3x^2[3 - x \ln 3]$

10. Find y' given $xe^y + 1 = xy$.

A. 0
B. $\dfrac{y - e^y}{xe^y - x}$
C. $\dfrac{e^y}{xe^y - 1}$
D. $\ln x$

11. If $\dfrac{dy}{dx} = \dfrac{4x - 7}{2x^2 - 7x + 5}$, then $y =$

A. $\frac{1}{2} \ln \left| 2x^2 - 7x + 5 \right| + C$
B. $\ln \left| 2x^2 - 7x + 5 \right| + C$
C. $\arctan(2x^2 - 7x + 5) + C$
D. $4x \ln(2x^2 - 7x + 5) + C$

12. $\displaystyle\int \frac{\ln 7x}{x} dx =$

A. $\frac{1}{2}(\ln 7x)^2 + C$
B. $2x \ln 7x - x + C$
C. $\frac{1}{7} \ln \frac{1}{7}x + C$
D. $7x \ln 7x + C$

13. Find the indefinite integral for $\displaystyle\int \frac{dx}{x(\ln(5x))}$.

A. $5 \ln |\ln(5x)| + C$
B. $\ln |\ln(5x)| + C$
C. $\frac{1}{5} \ln 5x + C$
D. $\frac{1}{5} \ln |\ln(5x)| + C$

14. Evaluate: $\int x\left(5^{x^2}\right)dx$

A. $\dfrac{5^{x^2}}{2\ln 5}+C$ B. $\dfrac{5^{x}}{2\ln 5}+C$

C. $\dfrac{10^{x^2}}{2\ln 5}+C$ D. $\dfrac{e^{x^2}}{2\ln 5}+C$

15. Evaluate: $\int \dfrac{7e^{x}}{e^{x}+5}\,dx$

A. $\frac{1}{7}e^{\ln(x+5)}+C$ B. $7e^{\ln(x+5)}+C$

C. $5\ln(e^{x}+7)+C$ D. $7\ln(e^{x}+5)+C$

16. $\dfrac{d}{dx}\displaystyle\int_{7x}^{x^4}\sqrt{t^2-1}=$ _____

17. The average value of $f(x)=\dfrac{x^2+5}{x}$ on the closed interval $[1,e]$ is

A. $\dfrac{e^2+9}{2}$ B. $\dfrac{e^2+9}{2(e-1)}$

C. $\dfrac{e^2-5e-4}{2e}$ D. $\frac{1}{2}e^2+9$

18. Find the minimum and maximum values of $y=2^{\sin\theta}$.

A. min $=\frac{1}{2}$; max $=2$ B. min $=1$; max $=3$

C. min $=0$; max $=2$ D. min $=1$; max $=2$

19. If $f(x)=e^{x^2-2x}$, then a minimum point on the curve is

A. $(-1,\frac{1}{e^3})$ B. $(1,\frac{1}{e})$

C. $(0,e)$ D. $(\ln 1,2)$

20. Given the curve $f(x)=x^2e^{x}$, find the y-coordinate of the relative maximum point.

A. 2 B. $\dfrac{4}{e^2}$ C. $-\dfrac{4}{e^2}$ D. $\dfrac{2}{e^4}$

21. How many critical points does f have on the open interval $(0,10)$ if $f'(x)=\dfrac{e^{-2x}}{x^3}-\sin x$?

A. 1 B. 3 C. 4 D. 5

22. Let $f(x) = \sin x$ for $0 \le x \le 2\pi$, and let $g(x) = \ln x$ for all $x > 0$. Let S be the composition of g with f, $S(x) = g(f(x))$. Find the slope of the tangent line to the graph of S at $x = \frac{\pi}{4}$.

A. 1 B. π C. $\frac{\sqrt{3}}{2}$ D. $\frac{1}{2}$

23. If $f(x) = x^2 e^{-4x}$ find a point where the tangent is horizontal.

A. $(0, 1)$ B. $(\frac{1}{2}, e^2)$

C. $(-2, \frac{4}{e^2})$ D. $(\frac{1}{2}, \frac{1}{4e^2})$

24. Find the point on the curve $y = 5\ln(4 - x^2)$ where the tangent is horizontal.

A. $(5, 5\ln 4)$ B. $(0, 5\ln 2)$

C. $(0, 10\ln 2)$ D. $(0, \ln 4)$

Unit 5 Quiz 1 Review 11/20/2017

1.
Answer: A

2.
Answer: A

3.
Answer: C

4.
Answer: A

5.
Answer: B

6.
Answer: C

7.
Answer: D

8.
Answer: D

9.
Answer: A

10.
Answer: B

11.
Answer: B

12.
Answer: A

13.
Answer: B

14.
Answer: A

15.
Answer: D

16.
Answer: $4x^3\sqrt{(x^4)^2-1}-7\sqrt{(7x)^2-1}$

17.
Answer: B

18.
Answer: A

19.
Answer: B

20.
Answer: B

21.
Answer: C

22.
Answer: A

23.
Answer: D

24.
Answer: C