

7. $\lim_{x \rightarrow 1} \frac{x}{\ln x}$ is

A. 0

B. $\frac{1}{e}$

C. 1

D. e

E. nonexistent

8. $\frac{d}{dx}(\ln e^{2x}) =$

A. $\frac{1}{e^{2x}}$

B. $\frac{2}{e^{2x}}$

C. $2x$

D. 1

E. 2

9. If $f(x) = x + \sin x$, then $f'(x) =$

A. $1 + \cos x$

B. $1 - \cos x$

C. $\cos x$

D. $\sin x - x \cos x$

E. $\sin x + x \cos x$

10. If $y = \cos^2 3x$, then $\frac{dy}{dx} =$

Rewrite $y = [\cos(3x)]^2$

**$\frac{d}{dx}[AT^2]$
 $\frac{d}{dx}[\cos(AT)]$**

A. $-6 \sin 3x \cos 3x$

B. $-2 \cos 3x$

C. $2 \cos 3x$

D. $6 \cos 3x$

E. $2 \sin 3x \cos 3x$

11. If $f(x) = e^{1/x}$, then $f'(x) =$

$\frac{d}{dx}[e^{AT}]$

A. $-\frac{e^{1/x}}{x^2}$

B. $-e^{1/x}$

C. $\frac{e^{1/x}}{x}$

D. $\frac{e^{1/x}}{x^2}$

E. $\frac{1}{x} e^{(1/x)-1}$

12. If $y = 10^{x^2-1}$, then $\frac{dy}{dx} =$

$\frac{d}{dx}[b^{AT}]$

A. $(\ln 10)10^{x^2-1}$

B. $(2x)10^{x^2-1}$

C. $(x^2-1)10^{x^2-2}$

D. $2x(\ln 10)10^{x^2-1}$

E. $x^2(\ln 10)10^{x^2-1}$

13. If $y = \cos^2 x - \sin^2 x$, then $y' =$

Rewrite [trig] power

$2 \sin x \cdot \cos x = \sin(2x)$

A. -1

B. 0

C. $-2 \sin(2x)$

D. $-2(\cos x + \sin x)$

E. $2(\cos x - \sin x)$

$$\frac{d}{dx} [\tan^{-1}(At)] =$$

14. If $y = \arctan(\cos x)$, then $\frac{dy}{dx} =$

A. $\frac{-\sin x}{1 + \cos^2 x}$

B. $-(\operatorname{arcsec}(\cos x))^2 \sin x$

C. $(\operatorname{arcsec}(\cos x))^2$

D. $\frac{1}{(\arccos x)^2 + 1}$

E. $\frac{1}{1 + \cos^2 x}$

15. $\frac{d}{dx} \left(\frac{1}{x^3} - \frac{1}{x} + x^2 \right)$ at $x = -1$ is

☑ Rewrite w/out division

A. -6

B. -4

C. 0

D. 2

E. 6

16. $\frac{d}{dx} \ln \left(\frac{1}{1-x} \right) =$

$$\frac{d}{dx} [\ln(At)]$$

A. $\frac{1}{1-x}$

B. $\frac{1}{x-1}$

C. $1-x$

D. $x-1$

E. $(1-x)^2$

17. If $f(x) = x \ln(x^2)$, then $f'(x) =$

☺ Product Rule ☺

A. $\ln(x^2) = 1$

B. $\ln(x^2) + 2$

C. $\ln(x^2) + \frac{1}{x}$

D. $\frac{1}{x^2}$

E. $\frac{1}{x}$

18. If $f(x) = (x-1)^{\frac{3}{2}} + \frac{e^{x-2}}{2}$, then $f'(2) =$

A. 1

B. $\frac{3}{2}$

C. 2

D. $\frac{7}{2}$

E. $\frac{3+e}{2}$

19. If $f(x) = \frac{e^{2x}}{2x}$, then $f'(x) =$

A. 1

B. $\frac{e^{2x}(1-2x)}{2x^2}$

C. $\frac{e^{2x}(2x+1)}{x^2}$

D. e^{2x}

E. $\frac{e^{2x}(2x-1)}{2x^2}$

☺ Product rule

20. If $f(x) = x\sqrt{2x-3}$, then $f'(x) =$

A. $\frac{3x-3}{\sqrt{2x-3}}$

B. $\frac{x}{\sqrt{2x-3}}$

C. $\frac{1}{\sqrt{2x-3}}$

D. $\frac{-x+3}{\sqrt{2x-3}}$

E. $\frac{5x-6}{2\sqrt{2x-3}}$