1. If $f(x)=\cos(\ln(x))$ for $x>0$, then $f'(x)=$

(a) $-\sin(\ln(x))$ (b) $\sin(\ln(x))$ (c) $-\dfrac{\sin(\ln(x))}{x}$ (d) $\dfrac{\sin(\ln(x))}{x}$ (e) $\sin\left(\dfrac{\ln(x)}{x}\right)$

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

(a) $2^x(x+\ln(2))$ (b) $2^x(1+\ln(2))$ (c) $x\cdot 2^x\cdot\ln(2)$ (d) $2^x(1+x\ln(2))$ (e) $x\cdot 2^x(1+\ln(2))$

3. Let $f(x)=x^3-x+2$. If h is the inverse of *f*, then $h'(2)=$

(a) $\dfrac{1}{26}$ (b) $\dfrac{1}{4}$ (c) $\dfrac{1}{2}$ (d) 2 (e) 26

Let *f* and *g* be two differentiable functions. The following table contains information about, *f*,*g*, and their derivatives f' and g', respectively. What is the value of

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
1	4	–3	3	2
3	6	2	–2	3

4. What is the value of $\left(\dfrac{f}{g}\right)'(1)$?

(a) $-\dfrac{3}{2}$ (b) $-\dfrac{1}{9}$ (c) $-\dfrac{17}{9}$ (d) $-\dfrac{14}{4}$ (e) $-\dfrac{17}{3}$

5. What is the value of $(f\cdot g)'(3)$?

(a) –6 (b) 6 (c) 12 (d) 14 (e) 22

6. $\dfrac{d}{dx}\left[5\sin^2(6x)+5\cos^2(6x)\right]=$

(a) $30\cos^2(6x)-30\sin^2(6x)$

(b) $5\cos^2(6x)-5\sin^2(6x)$

(c) $120\sin(6x)\cos(6x)$

(d) 30

(e) 0

7. An equation of the line tangent to the curve $x^2+y^2=25$ at $(-4,3)$ is

(a) $3y-4x=25$ (b) $4y-3x=25$ (c) $-4y+3x=20$ (d) $3y+4x=-25$ (e) $3y-4x=20$

8. $\frac{d}{dx}\left[\ln(3x)\cdot 5^{2x}\right] =$

(a) $\frac{5^{2x}}{x}+2\ln(5)\ln(3x)5^{2x}$ (b) $\frac{5^{2x}}{3x}-2x\ln(3x)5^{2x}$ (c) $\frac{5^{2x}}{x}-\ln(5)\ln(3x)5^{2x}$

(d) $\frac{5^{2x}}{3x}+2\ln(3x)5^{2x}$ (e) $\frac{5^{2x}}{x}+\ln(5)\ln(3x)5^{2x}$

9. If $e^{xy+1}=3$, what is $\frac{dy}{dx}$ at $x=1$? Hint: You will need to solve for the value of y!

(a) $\frac{1}{\ln(3)}$ (b) $1-\ln(3)$ (c) $\ln(3)-1$ (d) $3e^3$ (e) $\ln(3)$

10. What is the 57^{th} derivative of $y=\cos(7x)$?

(a) $-7^{57}\sin(7x)$ (b) $7^{57}\sin(7x)$ (c) $-7^{57}\cos(7x)$ (d) $7^{58}\sin(7x)$ (e) $7^{57}\cos(7x)$

11. $\left[\arctan\left(e^{x^2}\right)\right]' =$

(a) $\frac{2xe^{x^2}}{1+e^{2x^2}}$ (b) $\frac{4xe^{x^2}}{1+e^{x^4}}$ (c) $\frac{2x}{1+e^{2x^2}}$ (d) $\frac{2xe^{x^2}}{1+e^{x^2}}$ (e) $\frac{2xe^{x^2}}{\sqrt{1-e^{2x^2}}}$

12. If $\tan(2y)=xe^y$, then $y'=$

(a) $\frac{\sec^2 2y}{e^y}$ (b) $\frac{e^y}{2\sec^2(2y)-xe^y}$ (c) $\frac{e^y+xe^y}{2\sec^2(2y)}$

(d) $\frac{e^y}{\sec^2(2y)-xe^y}$ (e) $\frac{e^y}{2\sec(2y)\tan(2y)-xe^y}$

13. Given the equation of the curve $xy=5+y$, where y is a twice differentiable function of x, what is y''?

(a) $\frac{1-x+y}{(1+x^2)}$ (b) 0 (c) $\frac{2y}{(x-1)^2}$ (d) $-\frac{2y}{(x-1)^2}$ (e) $-\frac{y}{x-1}$

14. The graph of f at right consists of line segments and a semicircle. $f'(x)=0$ when

(a) 1 only
(b) 2 only
(c) 4 only
(d) 1 and 4
(e) 2 and 6