Derivatives: Various Rules and WRT

Numberbender | WORKSHEET

Name: _____ Date: _____ Score: _____

Find dy/dx for each function. Show all work.

Calculus I
Worksheet 18

Find $\frac{dy}{dx}$ for #1 – 12.	
1. $y = \frac{2-x}{3x+1}$	2. $y = \ln \frac{e^x}{e^x - 1}$
3. $y = \frac{e^{\ln x}}{x}$	4. $y = \cos^2 x$
5. $y = x^{\ln x}$	6. $y = x(\ln^3 x)$
7. $x = t - \sin t$ and $y = 1 - \cos t$	8. $y = 3^{2x}$.
9. $y = x^2 \ln x$.	10. $y = \sqrt{5-2x}$
11. $y = \frac{x-3}{2-5x}$	12. $y = \sqrt{x^2 + 2x - 5}$

13. If $y = \sqrt{x^2+1}$, then find the derivative of y^2 with respect to x^2.	14. If $y = x^2 + x$, then the derivative of y with respect to $\frac{1}{1-x}$ is ??
15. If y = sinx, then find the derivative of y with respect to tan x.	16. If $y = \sqrt{x^3 + 2x + 1}$, then find the derivative of y^2 with respect to cos x.
17. If $f(x) = \ln x$, then find $f^{iv}(x)$. Note: $f^{iv}(x)$ is the 4th derivative of f(x).	18. If $f(x) = x^4 - 4x^2$, then $f^{(IV)}(2) =$
19. If $y = e^{-x^2}$, then y''(0) equals ??	20. Write the equation of the line tangent to $y = 4x^2 + 3$ at (2, 19)

Derivatives: Various Rules and WRT

Numberbender | ANSWER KEY

Answer key — for instructor use only.

Answers:

1. $\frac{-7}{(3x+1)^2}$	2. $\frac{-1}{e^x-1}=\frac{1}{1-e^x}$	3. 0	4. $-2\cos x\sin x=-\sin 2x$
5. $x^{\ln x}\bullet\frac{2\ln x}{x}$	6. $x\ln^2 x+\ln^3 x$	7. $\frac{\sin t}{1-\cos t}$	8. $2\ln 3\bullet 3^{2x}$
9. $2x\ln x+x=x(2\ln x+1)$	10. $\frac{-1}{\sqrt{5-2x}}$	11. $\frac{-13}{(2-5x)^2}$	12. $\frac{x+1}{\sqrt{x^2+2x-5}}$
13. 1	14. $(2x+1)(1-x^2)$	15. $\cos^3 x$	16. $\frac{-3x^2-2}{\sin x}$
17. $-6x^{-4}$	18. 24	19. -2	20. y – 19 = 16(x – 2)