

As you are studying for the test, do some of the problems from this worksheet but do NOT spend all your time doing these problems. Make sure you spend time studying all the topics from the test review sheet. Use the product rule to take the derivative of the following functions:

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|----------------------|----------------------|---------------------------|
| 1. $(x+1)(x^2+3x+5)$ | 4. $x^9\sqrt{x^4+7}$ | 7. $x(x^2+1)^4$ |
| 2. $(x^4+2)\ln(x)$ | 5. $x\sqrt{x}$ | 8. $(5x+1)\sqrt{x^2-3}$ |
| 3. $(e^x+1)(e^x+5x)$ | 6. $\sqrt{x}e^x$ | 9. $(2e^x+9)\sqrt{x^2-3}$ |

Use the quotient rule to take the derivative of the following functions:

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|------------------------------|------------------------------|------------------------------------|
| 1. $\frac{x-1}{x+1}$ | 4. $\frac{x^2+x}{e^x+7}$ | 7. $\frac{x^4-4x^2+3}{x}$ |
| 2. $\frac{\ln x-1}{\ln x+1}$ | 5. $\frac{x}{x+\frac{1}{x}}$ | 8. $\frac{\sqrt{x}-1}{\sqrt{x}+1}$ |
| 3. $\frac{3x^2+5x+1}{3-x^2}$ | 6. $\frac{x}{\sqrt{x}+1}$ | 9. $\frac{e^x+\ln x}{x^7+4x}$ |

Use the chain rule to take the derivative of the following functions:

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|----------------------|---------------------------|--------------------------|
| 1. $\sqrt{x^2+4x}$ | 4. $\ln\sqrt{x}$ | 7. $\ln x^8 + (\ln x)^8$ |
| 2. $e^{\sqrt{x}+8x}$ | 5. $(e^{5x} + \ln x^2)^4$ | 8. $(2x+7)^5$ |
| 3. $\ln 4x^3 + 2x^2$ | 6. $e^{\pi x}$ | 9. e^{4x^3} |

Now take the derivative of the following functions (I'm not telling you which rules you should use. In some cases, you may have to use multiple rules for the same problem):

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|---------------------------|----------------------------|---|
| 1. $\ln \frac{2x+7}{4-x}$ | 4. $e^{2x\sqrt{x^2+4x}}$ | 7. $\frac{e^{x^2}-x^2}{e^{2x}+e^{-2x}}$ |
| 2. $\ln x\sqrt{x}$ | 5. $\frac{\ln x^2+7}{x+1}$ | 8. $(x^5+x^4)e^{7x+2}$ |
| 3. $e^{x/(x-1)}$ | 6. $(x^3+2x)\ln x^3+2x$ | 9. $\ln e^{4x^2}+e^{2x}$ |

How to Check Your Work

- Go to <http://www.wolframalpha.com/>
- Type in "derivative of YOUR FUNCTION HERE." For example, to find the derivative of $(x+1)(x^2+3x+5)$, type in
`"derivative of (x+1)(x^2+3x+5)"`
- Wolfram will show you a step by step guide of how to find the answer. Click where it says "Step-by-step solution." To see this, you need to create a free account with them or use your facebook login