

Math 114 Fall 2018  
Calculus I HW 8 Solutions  
Due Wednesday, November 14

1. Stewart 3.2.6
2. Stewart 3.2.8
3. (★) Stewart 3.2.16
4. (★) Stewart 3.2.24
5. Stewart 3.2.36
6. Stewart 3.2.38
7. Stewart 3.2.44
8. Stewart 3.2.48
9. Stewart 3.2.52
10. Stewart 3.2.64
11. Stewart 3.3.12
12. Stewart 3.3.16
13. Stewart 3.3.28
14. Stewart 3.3.32

15. Stewart 3.3.44

16. Stewart 3.3.46

17. Compute  $\frac{d}{dx}x^{x^2}$ .

**Solution:**

$$\begin{aligned}\frac{d}{dx}x^{x^2} &= \frac{d}{dx}e^{x^2 \ln x} = e^{x^2 \ln x} \frac{d}{dx}x^2 \ln x \\ &= e^{x^2 \ln x} (2x \ln x + x^2/x) \\ &= x^{x^2} (2x \ln x + x)\end{aligned}$$

Alternatively,

$$\begin{aligned}y &= x^{x^2} \\ \ln y &= x^2 \ln x \\ \frac{y'}{y} &= 2x \ln x + x^2/x \\ y' &= y(2x \ln x + x^2/x) = x^{x^2} (2x \ln x + x).\end{aligned}$$