

Math 151.02 Practice Gateway Solutions
(not guaranteed to be correct)

1. $3\pi x^{\pi-1} - \frac{1}{3}ex^{-4/3}$
2. $[2t \sec^2(t^2) + \tan(t^2) \cos t]e^{\sin t}$
3. $-3 \tan(3v)$
4. $\frac{1}{2\sqrt{1-x^2}}$
5. $\frac{[6y^2 - e^{y^2}][10(2y+3)^4(\sin y) + (2y+3)^5(\cos y)] - [(2y+3)^5(\sin y)(12y - 2ye^{y^2})]}{(6y^2 - e^{y^2})^2}$
6. $4^{\cos^3(5t)} \left[\frac{4t^3}{t^4 - 8} - 15(\ln 4) \cos^2(5t) \sin(5t) \ln(t^4 - 8) \right]$
7. $4ex^{e-1}$
8. $-10t(\cos(5t^2)) \sin(\sin(5t^2))$
9. $3e^{\tan v} \left[\frac{1}{v} + (\sec^2 v)(\ln v) \right]$
10. $\frac{-3}{(2-x)(4+x)\sqrt{\ln \frac{2-x}{4+x}}}$
11. $\frac{(3-2y)(3y^2 + 7 \sin y) + 2(y^3 - 7 \cos y)(9 - 2y)}{e^{-2y}(3-2y)^7}$

$$12. \frac{5t^4 2^{\sin^4(e^t)}}{\sqrt{1 - (t^5 + 6)^2}} + 4(\ln 2)e^t 2^{\sin^4(e^t)} \sin^3(e^t) \cos(e^t) \arcsin(t^5 + 6)$$

$$13. \frac{e^x}{\pi} - e\pi x^{e\pi-1}$$

$$14. \frac{2t}{(t^{-3} - t)(1 + t^4)} + \frac{(3t^{-4} + 1) \arctan(t^2)}{(t^{-3} - t)^2}$$

$$15. 3(\ln(p) + 1) \sec^2(3p) + \frac{\tan(3p)}{p}$$

$$16. -(\ln 2)2^x \tan(2^x)$$

$$17. \frac{-(3\pi/4)e^{\pi s}(3e^{\pi s} + 1)^{-3/4}(\arcsin(7s^2)) + \frac{2(\ln 7)s7s^2(3e^{\pi s} + 1)^{1/4}}{\sqrt{1-7^2s^2}}}{[(\arcsin(7s^2))(3e^{\pi s} + 1)^{1/4}]^2}$$

$$18. 2 \left[\sin \left(\frac{e^{2y-4}}{\ln(3y)} \right) \right] \left[\cos \left(\frac{e^{2y-4}}{\ln(3y)} \right) \right] \left[\frac{e^{2y-4}(2 \ln(3y) - y^{-1})}{(\ln(3y))^2} \right]$$

$$19. 7(2x^3 + 4x^2 - 7x + 1)^6(6x^2 + 8x - 7) + 60x^3$$

$$20. \frac{2t(3t^3 - 2t)}{\sqrt{1 - t^4}} + (9t^2 - 2) \arcsin(t^2)$$