

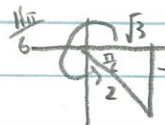
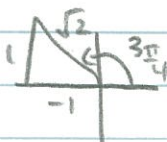
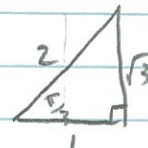
7.5 P.333 1-30

1. $y = \csc x$ at $x = 5$
 $y' = -\csc x \cot x$ (1)
 $y' = -\csc 5 \cot 5$
 $y' = -0.30848$

2. $y = \cot x$; $x = -8$
 $y' = -\csc^2 x$
 $y' = -(\csc 8)^2$
 $y' = -1.02163$

3. $y = \tan x$; $x = 1.977$
 $y' = \sec^2 x$
 $y' = \sec^2(1.977)$
 $y' = 6.40518$

4. $y = \sec x$, $x = \frac{\pi}{3}$
 $y' = \sec x \tan x$
 $y' = \left(\sec \frac{\pi}{3}\right) \left(\tan \frac{\pi}{3}\right)$
 $y' = \left(\frac{2}{1}\right) \left(\frac{\sqrt{3}}{1}\right)$
 $y' = 2\sqrt{3}$



5. $y = -2 \tan x$; $x = \frac{3\pi}{4}$
 $y' = -2 \sec^2 x$
 $y' = -2 \left(\frac{\sqrt{2}}{-1}\right)^2$
 $y' = -2(2)$
 $y' = -4$

6. $y = \sqrt{3} \csc x$; $x = \frac{11\pi}{6}$
 $y' = -\sqrt{3} \csc x \cot x$
 $y' = -\sqrt{3} \left(\frac{2}{-1}\right) \left(\frac{\sqrt{3}}{-1}\right)$
 $y' = -6$

7. $y = \sec^4 x$
 $y' = \sec 4x \tan 4x (4)$
 $y' = 4 \sec 4x \tan 4x$

8. $y = \csc\left(\frac{1}{3}x\right)$
 $y' = -\csc\left(\frac{1}{3}x\right) \cot\left(\frac{1}{3}x\right) \left(\frac{1}{3}\right)$
 $y' = -\frac{1}{3} \csc\left(\frac{1}{3}x\right) \cot\left(\frac{1}{3}x\right)$

9. $y = -3 \cot(x^3)$
 $y' = +3 \csc^2(x^3) \cdot 3x^2$
 $y' = 9x^2 \csc^2(x^3)$

10. $y = \csc^2 5x$
 $y' = (\csc 5x)^{2-1}$
 $y' = 2(\csc 5x)^1 (-\csc 5x) (\cot 5x) (5)$
 $y' = -10(\csc^2 5x) (\cot 5x)$

11. $y = 6\sqrt{\sec 3x}$
 $y' = 6(\sec 3x)^{-1/2}$
 $y' = 3(\sec 3x)^{-1/2} \cdot \sec 3x \tan 3x (3)$
 $y' = 9\sqrt{\sec 3x} \tan 3x$

12. $y = 2 \tan^2 4x$
 $y' = 2(\tan 4x)^{2-1}$
 $y' = 4(\tan 4x) \sec^2 4x (4)$
 $y' = 16 \tan 4x \sec^2 4x$

7.5

$$13. \quad y = -4 \sec(3x+1)$$

$$y' = -4 \sec(3x+1) \tan(3x+1) (3)$$

$$y' = -12 \sec(3x+1) \tan(3x+1)$$

$$14. \quad y = 6 \cot(2x^3-9)$$

$$y' = -6 \csc^2(2x^3-9) (6x^2)$$

$$y' = -36x^2 \csc^2(2x^3-9)$$

$$15. \quad y = -5 \sec^3 2x$$

$$y = -5 (\sec 2x)^3$$

$$y' = -15 (\sec 2x)^2 \cdot \sec 2x \cdot \tan 2x \cdot 2$$

$$y' = -30 (\sec^3 2x) (\tan 2x)$$

$$16. \quad y = x^2 \tan 3x$$

$$y' = 2x \tan 3x + x^2 \sec^2 3x (\cdot 3)$$

$$y' = x (2 \tan 3x + 3x \sec^2 3x)$$

$$17. \quad y = x^4 \cot 8x$$

$$y' = 4x^3 \cot 8x + x^4 (-\csc^2 8x) (8)$$

$$y' = 4x^3 (\cot 8x - 2x \csc^2 8x)$$

$$18. \quad y = \frac{4x}{\sec 2x}$$

$$y' = \frac{4(\sec 2x) - 4x(\sec 2x)(\tan 2x)}{\sec^2 2x}$$

$$y' = \frac{4 - 8x \tan 2x}{\sec 2x}$$

$$y' = \frac{4(1 - 2x \tan 2x)}{\sec 2x}$$

$$19. \quad y = \tan \sqrt{x-1}$$

$$y = \tan (x-1)^{1/2}$$

$$y' = \sec^2 (x-1)^{1/2} \cdot \frac{1}{2} (x-1)^{-1/2}$$

$$y' = \frac{\sec^2 \sqrt{x-1}}{2\sqrt{x-1}}$$

$$20. \quad y = 3e^{\cot x}$$

$$y' = 3e^{\cot x} \cdot -\csc^2 x$$

$$y' = -3e^{\cot x} \cdot \csc^2 x$$

$$21. \quad y = \csc(e^{2x})$$

$$y' = -\csc(e^{2x}) \cot(e^{2x}) (e^{2x} \cdot 2)$$

$$y' = -2e^{2x} \csc(e^{2x}) \cot(e^{2x})$$

$$22. \quad y = \ln(\sec 7x^2)$$

$$y' = \frac{1}{\sec 7x^2} \cdot \sec 7x^2 \tan 7x^2 \cdot 14x$$

$$y' = 14x \tan 7x^2$$

$$23. \quad y = 3 \ln(\tan 9x)$$

$$y' = \frac{3}{\tan 9x} \cdot \sec^2 9x \cdot (9)$$

$$y' = \frac{27 \sec^2 9x}{\tan 9x}$$

$$24. \quad y = e^{2x} \cot(e^x)$$

$$y' = e^{2x} \cdot 2 \cot(e^x) + e^{2x} (-\csc^2 e^x) (e^x)$$

$$\Rightarrow y' = e^{2x} (2 \cot(e^x) - e^x \csc^2 e^x)$$

7.5

25. $y = (\sec x)(\sec 2x)$

$y' = \sec x \tan x \sec 2x + \sec x \sec 2x \tan 2x (2)$

$y' = \sec x \sec 2x (\tan x + 2 \tan 2x)$

26. $y = 2x^3 + \tan(2x^3)$

$y' = 6x^2 + \sec^2 2x^3 (3x^2)$

$y' = 6x^2 [1 + \sec^2 2x^3]$

27. $y = \ln(\csc^2 6x)$

$y' = \frac{1}{\csc^2 6x} \cdot 2(\csc 6x)' \cdot (-\csc 6x \cot 6x) (6)$

$y' = -12 \cot 6x$

28. $y = (2x+1)(\cot x^2)$

$y' = (2)(\cot x^2) + (2x+1)(-\csc^2(x^2))(2x)$

$y' = 2 [\cot x^2 - x(2x+1)(\csc^2(x^2))]$

29. $y = e^{\ln(\tan x)}$

$y = \tan x$

$y' = \sec^2 x$

30. $y = 6 \sec 5$

$y' = 0$