Finding the Derivative at a Point

Directions: Find the slope of the tangent line (or the slope of the function or the instantaneous rate of change) at the given x-value or point for each equation.

1. $y = 5x^2 + 3x - 1$ at $x = 2$
2. $y = 5x^{-3} + 5$ at $x = 3$
3. $y = \frac{x+2}{5x-1}$ at $x = 4$
4. $y = x^2 e^x$ at $x = 3$
5. $y = (3x - 1)(2^x)$ at $x = 5$
6. $y = \frac{e^x}{\ln x}$ at $x = e$
7. $y = \sin(3x)\cos(2x)$ at $x = \pi$
8. $y = \ln(x^2)$ at $x = 3$
9. $y = \log_4(x^2 - x - 1)$ at $x = 4$
10. $y = \frac{x^2+1}{\cos x}$ at $x = \pi$
11. $y = \ln(\sin(x^2))$ at $x = \sqrt{\frac{\pi}{6}}$
12. $y = \tan^{-1}(7x)$ at $x = 2$
13. $y = \frac{\sin^{-1}(2x)}{x^2}$ at $x = \frac{1}{4}$
14. $y = \sec^{-1}(\sqrt{x})$ at $x = 2$
15. $y = \ln(e^x + x + 1)$ at $x = 0$
16. $xy + y^3 = x^2 - y^2 + 13$ at $(1,2)$
17. $\sin(xy) + x^2 - y = \frac{-xy}{2} + 4$ at $(2, \pi)$
18. $x^2y + xy^2 = 2xy$ at $(1,1)$
19. $x \sin y + \tan y = x^2$ at $\left(\sqrt{2}, \frac{\pi}{4}\right)$
20. $\frac{x+y}{x-y} = x^2y^2 - 41$ at $(2,3)$