

1. $\frac{1}{\sqrt{1+x^2}}$
2. $\frac{x}{\sqrt{1-x^2}}$
3. $\frac{\sqrt{3}}{2}$
4. $\frac{5}{4}$
5. $y' = -4 \cos^3(\tan \theta) \sin(\tan \theta) \sec^2 \theta$
6. $f'(x) = 6x \sec(3x^2 + 1) \tan(3x^2 + 1)$
7. $y' = 2 \sin \theta \cos \theta \sin(\theta^2) + 2\theta \sin^2 \theta \cos(\theta^2)$
8. $r'(x) = 18x^5 \cos(x^2 + 1) - 6x^7 \sin(x^2 + 1)$
9. $g'(t) = \frac{3e^t}{(1 - 4e^t)^2}$
10. $g'(x) = 2xe^{x^2} \ln(x^2 + 1) + \frac{2xe^{x^2}}{x^2 + 1}$
11. $s'(t) = \frac{\frac{1}{t}(1 + e^t) - e^t \ln t}{(1 + e^t)^2}$
12. $f'(x) = ex^{e-1} \ln(5x) + x^{e-1}$
13. $y' = \frac{2x}{\sqrt{1 - (x^2 + 1)^2}}$
14. $g'(t) = 0$
15. $y' = -\frac{1}{2\sqrt{x}\sqrt{1 - (1 + \sqrt{x})^2}}$
16. $v'(t) = \frac{-\sin t}{1 + \cos^2 t}$
17. $dy = \frac{3}{2} \frac{x^2}{\sqrt{4 + x^3}} dx$
18. $dy = \frac{2x + 2}{x^2 + 2x + 1} dx$

19. The numbers are 50 and -50 .

20. The dimensions are $10\sqrt{10} \text{ m} \times 10\sqrt{10} \text{ m}$.

21. $f'(x) = \frac{e^x - e^{-x}}{2}$

22. $f'(x) = \frac{e^x + e^{-x}}{2}$