

1. Let $f(x) = x^5 + 2x^3 + x - 1$.
A. Find $f(1)$ and $f'(1)$.

B. Find $f^{-1}(3)$ and $(f^{-1})'(3)$.

2. Let $f(x) = \cos x + 3x$.
A. Find $f(0)$ and $f'(0)$.

B. Find $f^{-1}(1)$ and $(f^{-1})'(1)$.

3. Let: $f(x) = 2x + e^x - 3$ Find: $(f^{-1})'(-2)$

4. Let: $f(x) = x^3 - 3$ Find: $(f^{-1})'(-11)$

5. Let: $f(x) = 2x + 9$ Find: $(f^{-1})'(-7)$

6. Let: $f(x) = x^3 + 2x^2 + 4x + 8$ Find: $(f^{-1})'(15)$

7-10: Find the derivative of y with respect to the appropriate variable.

7. $y = \cos^{-1}(x^2)$

8. $y = \cos^{-1}\left(\frac{1}{x}\right)$

9. $y = \sin^{-1}(\sqrt{2}t)$

10. $y = \sin^{-1}(1-t)$

11-16: Find the derivative of y with respect to the appropriate variable.

11. $y = \sin^{-1}\left(\frac{3}{x^2}\right)$

12. $y = \cot^{-1}(\sqrt{t})$

13. $y = x\sqrt{1-x^2} + \cos^{-1}x$

14. $y = \frac{1}{\sin^{-1}(2x)}$

15. $y = \cot^{-1}\sqrt{x-1}$

16. $y = \sec^{-1}(5m)$

17-20: Find an equation for the tangent to the graph of y at the indicated point.

17. $y = \sec^{-1} x$, at $x = 2$

18. $y = \tan^{-1} x$, at $x = 2$

19. $y = \sin^{-1}\left(\frac{x}{4}\right)$, at $x = 3$

20. $y = \tan^{-1}(x^2)$, at $x = 2$

Answers:

1a. 12 1b. 3

2a. $\frac{1}{12}$ 2b. $\frac{1}{3}$

3. $\frac{1}{3}$ 4. $\frac{1}{12}$

5. $\frac{1}{2}$ 6. $\frac{1}{11}$

7. $y' = \frac{-2x}{\sqrt{1-x^4}}$

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

9. $y' = \frac{\sqrt{2}}{\sqrt{1-2t^2}}$

10. $y' = \frac{-1}{\sqrt{2t-t^2}}$

11. $y' = \frac{-6}{x\sqrt{x^4-9}}$

12. $y' = \frac{-1}{2\sqrt{t}(t+1)}$

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

14. $y' = \frac{-2}{[\sin^{-1}(2x)]^2 \sqrt{1-4x^2}}$

15. $y' = \frac{-1}{2x\sqrt{x-1}}$

16. $y' = \frac{1}{|m|\sqrt{25m^2-1}}$

17. $y - \sec^{-1}(2) = \frac{1}{2\sqrt{3}}(x-2)$

18. $y - \tan^{-1}(2) = \frac{1}{5}(x-2)$

19. $y - \sin^{-1}\left(\frac{3}{4}\right) = \frac{1}{\sqrt{7}}(x-3)$

20. $y - \tan^{-1}(4) = \frac{4}{17}(x-2)$