

Name: _____ Date: _____

1. Find the indefinite integral of the following function and check the result by differentiation.

$$\int (1+5s)^5 ds$$

2. Find the indefinite integral of the following function and check the result by differentiation.

$$\int z^4 (5 + z^5)^6 dz$$

3. Find the indefinite integral of the following function and check the result by differentiation.

$$\int t^6 \sqrt{3+t^7} dt$$

4. Find the indefinite integral of the following function and check the result by differentiation.

$$\int \frac{2x}{(x^2+5)^6} dx$$

5. Find the indefinite integral of the following function and check the result by differentiation.

$$\int \frac{4z^3}{\sqrt{z^4+3}} dz$$

6. Find the indefinite integral of the following function and check the result by differentiation.

$$\int (8-x)\sqrt{x} \, dx$$

7. Solve the differential equation.

$$\frac{df}{dt} = 4t + \frac{3t}{\sqrt{1-t^2}}$$

8. Solve the differential equation.

$$\frac{df}{ds} = \frac{4s+4}{(2s^2+4s+3)^2}$$

9. Find the indefinite integral of the following function.

$$\int \pi \cos 2\pi u \, du$$

10. Find the indefinite integral of the following function.

$$\int 4t^3 \cos t^4 \, dt$$

11. Find the indefinite integral of the following function.

$$\int \cos 6x \, dx$$

12. Find the indefinite integral of the following function.

$$\int \frac{\cos u}{\sin^5 u} \, du$$

13. Evaluate the following definite integral.

$$\int_5^9 \frac{1}{\sqrt{3x+6}} dx$$

Use a graphing utility to check your answer.

14. Evaluate the following definite integral.

$$\int_4^6 \frac{1}{\sqrt{t}(2+6\sqrt{t})^5} dt$$

Use a graphing utility to check your answer.

15. Write the following expression in algebraic form.

$$\cos(\arcsin(2x^3))$$

16. Write the following expression in algebraic form.

$$\sin(\arccos(8x))$$

17. Write the following expression in algebraic form.

$$\tan\left(\arcsin\left(\frac{x}{7}\right)\right)$$

18. Solve the following equation for x .

$$\arcsin(3x - \pi) = \frac{1}{2}$$

19. Solve the following equation for x .

$$\arccos(5x - \pi) = \frac{1}{2}$$

20. Find the derivative of the function $f(x) = 6 \arcsin(8x^2 + 2x - 4)$.

21. Find the derivative of the function $f(x) = 8 \arcsin(x - 10)$.

22. Find the derivative of the function $y = \arctan\left(\frac{x}{3}\right) + \frac{10x - 6}{3(x^2 + 8)}$.

23. Find an equation of the tangent line to the graph of $y = \arcsin(4x)$ at the point $\left(\frac{1}{4\sqrt{2}}, \frac{\pi}{4}\right)$.

24. Find the indefinite integral.

$$\int \frac{1}{\sqrt{49 - 81x^2}} dx$$

25. Find the indefinite integral.

$$\int \frac{1}{100 - (x - 4)^2} dx$$

26. Find the indefinite integral.

$$\int \frac{1}{x\sqrt{64x^2 - 25}} dx$$

27. Find the indefinite integral.

$$\int \frac{2x - 3}{x^2 + 8x + 41} dx$$

28. Find the indefinite integral.

$$\int \frac{dx}{\sqrt{-x^2 - 8x}}$$

29. Evaluate $\sinh(\ln(6))$ and $\cosh(\ln(2))$ in that order.

30. Evaluate $\sinh\left(\ln\left(\frac{1}{10}\right)\right)$ and $\cosh\left(\ln\left(\frac{1}{10}\right)\right)$ in that order.

31. Evaluate $\cosh(\ln(4))$ and $\tanh(\ln(4))$ in that order.

32. Evaluate $\cosh(\ln(6))$ and $\tanh(\ln(6))$ in that order.

33. Find the derivative of the function $y = \operatorname{sech}(3x + 5)$.

34. Find the derivative of the function $y = \operatorname{coth}(10x)$.

35. Find the derivative of the function $y = \ln(\cosh^{10}(6x))$.

36. Find the derivative of the function $y = \frac{1}{16} \sinh(8x) - 14 \operatorname{coth}\left(\frac{x}{7}\right) + \frac{x}{16}$.

37. Find the indefinite integral.

$$\int \sinh(5 - 6x) dx$$

38. Find the indefinite integral.

$$\int x^2 \operatorname{csch}^2\left(\frac{x^3}{3}\right) dx$$