Puzzles on Elementary Integral Calculus

1. Evaluate ∫ (3x^2 + 4x + 5) dx.

2. Find ∫ (2x / (x^2 + 1)) dx using substitution method.

3. Evaluate ∫ (x e^(x^2)) dx by substitution.

4. Compute ∫ (1 / (2x + 3)) dx.

5. Evaluate the definite integral ∫■² (4x + 1) dx.

6. Find ∫■³ (x^2 - 2x + 1) dx.

7. Evaluate ∫ (x ln x) dx using integration by parts.

8. Compute ∫ (e^x cos x) dx using integration by parts.

9. Find ∫ (x^2 sin x) dx.

10. Evaluate the improper integral ∫■^∞ (1/x^2) dx.

11. Determine whether ∫■^∞ (e^(-x)) dx converges or diverges.

12. Evaluate ∫ (1 / √(1 - x^2)) dx.

13. Find ∫ (x^3 + 2x) / x dx.

14. Evaluate ∫■^π sin x dx.

15. Use substitution to evaluate ∫ (cos 3x) dx.

16. Evaluate ∫ (x / (x^2 + 4)) dx.

17. Compute ∫ (ln x) dx using integration by parts.

18. Evaluate the improper integral ∫■^1 (1/√x) dx.

19. Find ∫ (x^2 e^x) dx using integration by parts.

20. Evaluate ∫■¹ (1 / (1 + x^2)) dx.