AP Physics C
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Integration by Substitution

Evaluate each indefinite integral.

1. $\int -15x^4 \left(-3x^5 - 1\right)^5 dx$

2. $\int -\dfrac{8x^3}{\left(-2x^4 + 5\right)} dx$

3. $\int -9x^2 \left(-3x^3 + 1\right)^3 dx$

4. $\int 15x^4 \left(3x^5 - 3\right)^{\frac{3}{5}} dx$

5. $\int 20x \sin \left(5x^2 - 3\right) dx$

6. $\int 36x^2 e^{4x^3+3} dx$

7. $\int \dfrac{2}{x \left(-1 + \ln 4x\right)} dx$

8. $\int 4e^{\cos-2x} \sin(-2x) dx$

9. $\int \left(x \cos \left(x^2\right) - \sin \left(\pi x\right)\right) dx$

10. $\int \tan x \ln \left(\cos x\right) dx$

Evaluate each definite integral.

11. $\int_{-1}^{2} 6x \left(x^2 - 1\right)^2 dx$

12. $\int_{7}^{8} \dfrac{2}{\left(x - 5\right)^3} dx$

13. $\int_{0}^{3} \dfrac{-3}{\left(x + 3\right)^2} dx$

14. $\int_{0}^{1} -12x^2 \left(4x^3 - 1\right)^3 dx$

15. $\int_{-2}^{2} 36x^3 \left(3x^4 + 3\right)^5 dx$

16. $\int_{-4}^{-1} \dfrac{-8x - 16}{\left(x^2 + 4x - 5\right)^4} dx$

17. $\int_{0}^{\sqrt{\frac{\pi}{2}}} x \cos x^2 dx$

18. $\int_{0}^{2} 80x^3 e^{5x^4-2} dx$

19. $\int_{-1}^{1} x^3 \sin \left(x^4 - 1\right) dx$

20. $\int_{1}^{e} \dfrac{\left(5 + \ln x\right)^5}{x} dx$