

Derivatives Drill Sheet

Find the derivative for each function.

General tips: simplify using algebra first, apply derivative rules carefully.

1. $f(x) = \frac{Cx^2e^{-x}-\sqrt{x}}{x}$ (Hint: x is the variable here, so C must be a constant.)

2. $f(u) = \frac{\sin(u^2)}{1+\cos(u)}$

3. $f(y) = \frac{1}{2y\sqrt{y}} + \frac{1}{4}r$ (Hint: What is the variable? What is the constant?)

4. $g(z) = \frac{4z}{6z^2+z^3}$

5. $f(x) = \ln(3x^2 + x^4)$

6. $g(y) = e^{y^2 \cos(2y)}$

7. $F(u) = \sqrt{u}(1 + \sqrt{u})$

8. $f(x) = 2^x + \left(\frac{1}{3}\right)^x$

9. $f(r) = \pi + r^\pi + e^\pi + \pi^r$

10. $F(v) = \frac{e^v}{v+\sec(v)\tan(v)}$

11. $f(x) = \frac{e^{-\tan(-x)}}{x+1}$

12. $G(z) = \text{Arctan}(e^{2z})$

13. $f(x) = x\text{Arcsin}(x)$

14. $f(z) = \text{Arcsec}(\ln(z))$

15. $f(x) = \frac{1}{(e^{-\pi}+1)^2}$

16. $f(w) = \ln(\ln(w))$

Anti-Derivatives Drill Sheet

Find the following antiderivatives.

General tips: simplify using algebra first, apply antiderivative rules carefully.

1. $\int \frac{Cx^2e^{-x}-\sqrt{x}}{x} dx$

2. $\int \frac{\sin(u)}{1+\cos(u)} du$

3. $\int \frac{1}{2y\sqrt{y}} + \frac{1}{4}r dy$

4. $\int \frac{[\ln(x)]^7}{x} dx$

5. $\int \frac{20z+6z^2+2}{5z^2+z^3+z} dz$

6. $\int \frac{4z+6}{3z+z^2} dz$

7. $\int \ln(3x^2)dx$

8. $\int 3ye^{y^2/2} dy$

9. $\int \sqrt{u} (1 + \sqrt{u}) du$

10. $\int 2^x + \left(\frac{1}{3}\right)^x dx$

11. $\int (\pi + r^\pi + e^\pi + \pi^r) dr$

12. $\int (e^{ev} + \sec(v/8) \tan(v/8))dv$

13. $\int \frac{e^{-\tan(-x)}}{\cos^2(-x)} dx$

14. $\int \frac{e^{2z}}{1+e^{4z}} dz$

15. $\int \text{Arcsin}(x)dx$

16. $\int \frac{2x \cos(x^2)}{\sqrt{\sin(x^2)+4}} dx$

17. $\int \frac{e^x - e^{-x}}{e^x + e^{-x}} dx$

18. $\int \frac{1}{P(P-M)} dP$