

Assignment 6-6

Integrate without using a calculator. Integration by parts will be used on most, but **not all** problems.

1. $\int x \sin x \, dx$

2. $\int x \cos(2x) \, dx$

3. $\int 4x e^{2x} \, dx$

4. $\int x^2 e^{x^3} \, dx$

5. $\int \frac{x}{e^x} \, dx$

6. $\int \ln x \, dx$

7. $\int \frac{\ln x}{x^2} \, dx$

8. $\int \frac{(\ln x)^2}{x} \, dx$

9. $\int \arctan x \, dx$

10. $\int x^2 \cos x \, dx$

11. $\int x^2 e^{2x} \, dx$

12. $\int_0^1 \frac{x}{1+x^2} \, dx$

13. $\int_{-3}^{-1} \frac{1}{\sqrt{7-x^2-6x}} \, dx$

14. $\int_0^1 x e^{3x} \, dx$

15. $\int_1^{e^2} x \ln x \, dx$

16. $\int x \arctan x \, dx$ *

Differentiate.

17. $y = 2 \arctan(e^{2x})$

18. $f(x) = \ln|\arcsin x|$

19. $g(t) = \sin(\arctan t)$

* $\int \frac{x^2}{1+x^2} \, dx$ can be
integrated using
long division

Evaluate the expressions. Remember not to use a calculator.

20. $\arccos \frac{1}{2}$

21. $\arcsin\left(\frac{-\sqrt{3}}{2}\right)$

22. $\arctan\left(\frac{-1}{\sqrt{3}}\right)$

23. Sketch a triangle to find $\tan y$, given that $y = \arcsin \frac{2}{3}$.

24. $\arcsin(x^2 - 1) = \frac{\pi}{6}$. Solve for x .