More Fun With Integration!

(Integrals by substitution, parts, or both)

1. $\int \theta \cos\theta \, d\theta$

2. $\int te^{-t} \, dt$

3. $\int (2\theta + 1)\sin(\theta^2 + \theta + 43) \, d\theta$

4. $\int_0^{\pi/6} \sin^2\theta \cos\theta \, d\theta$

5. $\int t^4 \ln t \, dt$

6. $\int_0^{\pi/4} z\cos(2z) \, dz$

7. $\int w3^w \, dw$

8. $\int_1^2 \frac{\ln t}{t^3} \, dt$

9. * $\int x^5 \sin(x^3) \, dx$

10. * $\int_0^{\pi/3} \cos^3\theta \, d\theta$

11. * $\int e^x \cos x \, dx$

12. * $\int_1^4 \ln\left(\sqrt{x}\right) dx$

13. * $\int (\ln z)^2 \, dz$

* = A more challenging integral