Problem Set 73

2. $\frac{\pi}{2}$ joules

4. $m = \frac{1}{9 \ln 3}$

   $y = \frac{1}{9 \ln 3} x + \left(2 - \frac{1}{\ln 3}\right)$

6. $\frac{1}{x \ln 2} + 4^x \ln 4 - \frac{1}{x \ln 6}$

8. $(\ln 24)(2x + 3)24^{x^2 + 3x}$

10. $\frac{x}{\sqrt{x^2 - 9}}$, when $|x| > 3$

12. $x \log_3 x - \frac{x}{\ln 3} + C$

14. $-\ln|\cos x| + C$
    or $\ln|\sec x| + C$

16. $\frac{1}{\ln 2} \int_2^8 \ln x \, dx$

18. $\left(\frac{\pi}{4}, 1\right)$

20. $\frac{16\pi}{3}$ units^3

22. ∞

24. $a = 0; \quad b = -3; \quad c = -2$
    $f(x) = x^3 - 3x - 2$