Problem Set 77

2. 4,900,000 joules

4. $180{,}000\int_0^2 y\left(\frac{5\sqrt{2}}{2}-y\right)dy$

6. $\sin x-\frac{1}{3}\sin^3 x+C$

8. $\frac{1}{2}x^2+\ln|x|+C$

10. $v(t) = -9.8t + 20$
$h(t) = -4.9t^2 + 20t + 100$

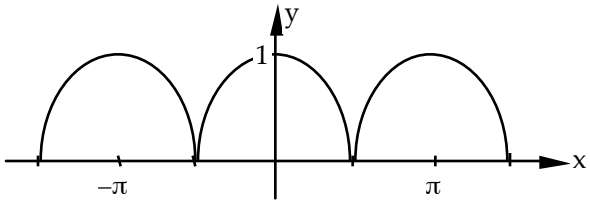
12a. 1
b. does not exist

14. 0

16. $\frac{1}{12}\text{unit}^2$

18a. $-\frac{3\pi}{2},\ -\frac{\pi}{2},\ \frac{\pi}{2},\ \frac{3\pi}{2}$

b.



c.

$$f'(x)=\begin{cases}-\sin x, & \left(-\frac{\pi}{2},\ \frac{\pi}{2}\right)\\ \sin x, & \left(-\frac{3\pi}{2},\ -\frac{\pi}{2}\right),\ \left(\frac{\pi}{2},\ \frac{3\pi}{2}\right)\\ \text{d.n.e.} & x=-\frac{3\pi}{2},\ -\frac{\pi}{2},\ \frac{\pi}{2},\ \frac{3\pi}{2}\end{cases}$$

20. $\frac{2}{4x^2+1}+\frac{\sin^2 x}{(\cos x+1)^{3/2}}+\frac{2\cos x}{\sqrt{\cos x+1}}+\sec^3 x+\sec x\tan^2 x$

22. $\frac{1}{4}$

24. C