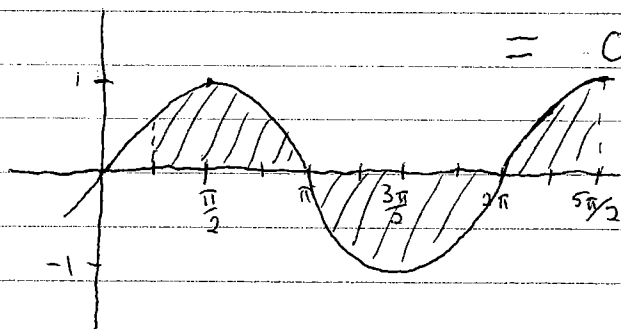


HW #4

5.3 46. $\int_{\frac{\pi}{4}}^{\frac{5\pi}{2}} \sin x \, dx = -\cos x \Big|_{\frac{\pi}{4}}^{\frac{5\pi}{2}}$

$$= 0 - (-\cos \frac{\pi}{4}) = \frac{\sqrt{2}}{2}$$

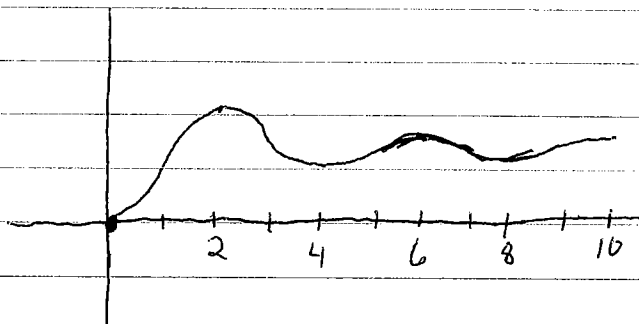


56. (a) g has local maxima at $x=2$ and $x=6$
and local minima at $x=4$ and $x=8$

(b) The absolute maximum is at $x=2$

(c) g is concave downward on $(1,3)$, $(5,7)$, and $(9,10)$

(d)



5.4 60. $\int_0^{10} (200 - 4t) \, dt = 200t - 2t^2 \Big|_0^{10}$

$$= 2000 - 200 = 1800 \text{ L}$$

$$5.5 \text{ \#16 } \int \sec 2\theta \tan 2\theta \, d\theta$$

$$u = 2\theta \quad du = 2d\theta$$

$$\int \sec u \tan u \cdot \frac{1}{2} du = \frac{1}{2} \int \sec u \tan u \, du$$

$$= \frac{1}{2} \sec u + C$$

$$= \frac{1}{2} \sec 2\theta + C$$

$$38. \int_0^{\sqrt{\pi}} x \cos(x^2) \, dx$$

$$u = x^2 \quad du = 2x \, dx$$

$$\text{If } x=0, u=0^2=0. \quad \text{If } x=\sqrt{\pi}, u=(\sqrt{\pi})^2=\pi$$

$$\int_0^{\pi} \frac{1}{2} \cos u \, du = \frac{1}{2} \sin u \Big|_0^{\pi}$$

$$= \frac{1}{2} (\sin \pi - \sin 0) = 0$$