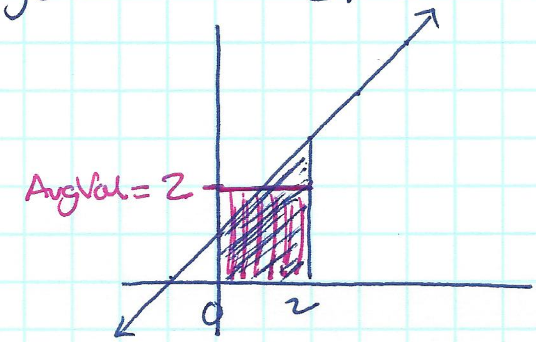
7. $g(t) = 1+t \quad [0,2]$

Avg Value $= \dfrac{1}{(2-0)} \int_0^2 (1+t)\,dt$

$= \dfrac{1}{2} \int_0^2 (1+t)\,dt$

$= 2$



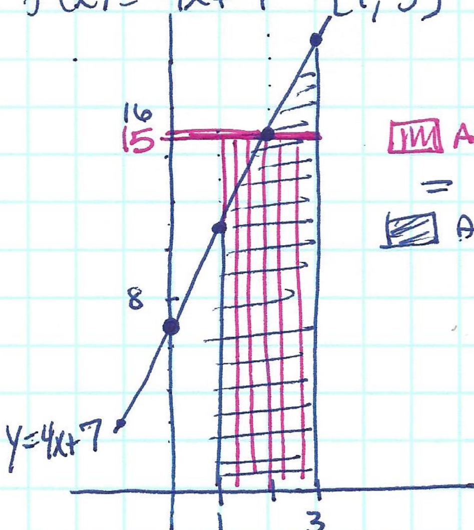
Area = Area

10. $f(x) = 4x+7 \quad [1,3]$

Avg Value $= \dfrac{1}{(3-1)} \int_1^3 (4x+7)\,dx$

$= \dfrac{1}{2} \int_1^3 (4x+7)\,dx$

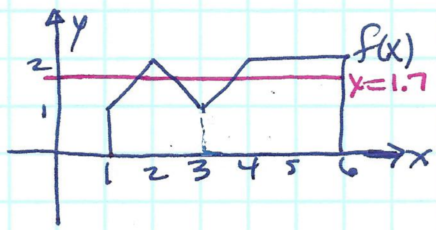
$= 15$



Area = Area

11. a) $\int_1^6 f(x)\,dx$

$= 8.5$



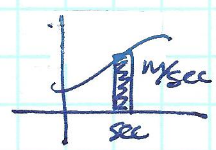
b) $\boxed{\text{Avg Value}}$ $\dfrac{1}{(6-1)} \int_1^6 f(x)\,dx$

$\dfrac{1}{5} \int_1^6 f(x)\,dx$

$= \dfrac{1}{5}(8.5) = \boxed{1.7}$

12. Avg Value $\dfrac{1}{(b-a)} \int_a^b f(x)\,dx$

If $f(x) = \dfrac{m}{sec}$ then $\int_a^b f(x)\,dx \Rightarrow$ meters



$(m/sec)(sec) = m$

& $\therefore$ Avg Value $= \dfrac{1}{\text{seconds}}(\text{meters}) = \dfrac{m}{sec.}$

$\boxed{\text{The units are the same}}$.

CH 5.4 p. 305 — #21, 25, 30, 34 DAY 90 G

21 a) $\int_0^3 f(x)\,dx = 6$ Avg Value $= \frac{1}{3}\int_0^3 f(x)\,dx = \frac{1}{3}(6) = 2$

b) $f(x)$ even $\rightarrow \int_{-3}^{3} f(x)\,dx = 2\int_0^3 f(x)\,dx = 12$

& Avg Value $\frac{1}{6}\int_{-3}^{3} f(x)\,dx = 2$

c) $f(x)$ odd $\rightarrow \int_{-3}^{3} f(x)\,dx = 0$ & Avg value $= \frac{1}{6}\int_{-3}^{3} f(x)\,dx = 0$

25 Value of Tiffany lamp. $V = 225(1.15)^t$

Avg Value from 1975–2010

Avg Val $= \frac{1}{35}\int_0^{35} 225(1.15)^t\,dt$.

$= 6079.62$

30 Avg Value $= \frac{1}{5-2}\int_2^5 f(x)\,dx = 4 \quad \therefore \int_2^5 f(x)\,dx = 12$

$$\int_2^5 (3f(x)+2)\,dx = 3\int_2^5 f(x)\,dx + \int_2^5 2\,dx$$
$$= 3(12) + (2)(3)$$
$$= 42$$

34 Bar of Metal Cooling: $H(t) = 20 + 980e^{-0.1t}$

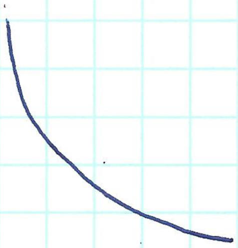
$H(t) \rightarrow (^\circ C)$

$t \rightarrow$ (minutes)

a) $H(1) = 906.7406697\ ^\circ C \approx 906.741^\circ C$

is temp of metal after 1 hour.

b) Avg Value $= \frac{1}{(1-0)}\int_0^1 H(t)\,dt = 952.593\ ^\circ C$



c) The graph of $H(t)$ is concave up.

So the Avg Value is smaller than the average of the temp at $t=0$ & $t=1$.

which is $953.371^\circ C > 952.593^\circ C$

Avg of Temps at $t=0$ & 1 $= \dfrac{H(0)+H(1)}{2}$

$= \dfrac{1000 + 906.741}{2}$

$= 953.3705^\circ$