Homework set #26 ~~#27~~ 7.5: 22, 24, 25, 26, 41
7.6: 3, 5

7.5

(22) $f(x) = \begin{cases} 2x & x < 1 \\ 2 & x \geq 1 \end{cases}$

a.) $\int_0^1 f(x)\,dx = x^2 \Big|_0^1 = \boxed{1}$

b.) $\int_{-1}^{1} f(x)\,dx = x^2 \Big|_{-1}^{1} = \boxed{0}$

c) $\int_1^{10} f(x)\,dx = 2x \Big|_1^{10} = \boxed{18}$

d.) $\int_{1/2}^{5} f(x)\,dx = \int_{1/2}^{1} 2x\,dx + \int_1^5 2\,dx$

$= x^2 \Big|_{1/2}^{1} + 2x \Big|_1^5 = \boxed{8.75}$

(24) $\int_1^4 3f(x) - g(x)\,dx$

$= 3\int_1^4 f(x) - \int_1^4 g(x)\,dx$

$= 6 - 10 = \boxed{-4}$

(25) $\int_1^5 f(x)\,dx$

$= \int_0^5 f(x)\,dx - \int_0^5 f(x)\,dx$

$= 1 - (-2) = \boxed{3}$

(26) $\int_3^{-2} f(x)\,dx = -\int_{-2}^{3} f(x)\,dx$

$\int_{-2}^{3} = \int_{-2}^{1} + \int_1^3$

$\int_{-2}^{3} = 2 - 6 = -4$

$-\int_{-2}^{3} f(x)\,dx = \int_3^{-2} f(x)\,dx = \boxed{4}$

(41) $A = \int_0^1 x^2 = 1/3\, x^3 \Big|_0^1$

$= \boxed{1/3}$