3-0235 — 50 SHEETS — 5 SQUARES
3-0236 — 100 SHEETS — 5 SQUARES
3-0237 — 200 SHEETS — 5 SQUARES
3-0137 — 200 SHEETS — FILLER
COMET

1) $f(x) = 3 - \frac{1}{2}x \qquad 2 \le x \le 14 \qquad n = 6$ left endpoints

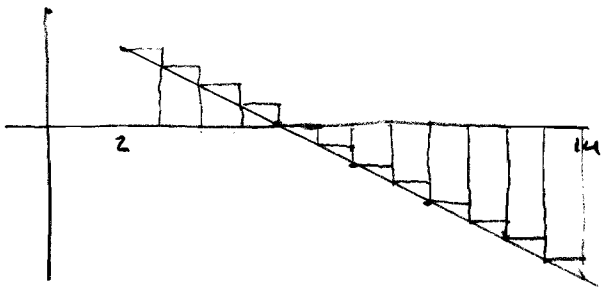
$\Delta x = \frac{14-2}{6} = 2$

$x_0 = 2,\ x_1 = 4,\ x_2 = 6,\ x_3 = 8,\ x_4 = 10,\ x_5 = 12,\ x_6 = 14$

$L_6 = 2(f(2) + f(4) + f(6) + f(8) + f(10) + f(12))$

$= 2(2 + 1 + 0 - 1 - 2 - 3)$

$\boxed{L_6 = -6}$



5) a. $\Delta x = \frac{8-0}{4} = 2$

$R_4 = 2(f(2) + f(4) + f(6) + f(8))$

$= 2(1 + 2 - 2 + 1)$

$\boxed{R_4 = 4}$

b. $L_4 = 2(f(0) + f(2) + f(4) + f(6))$

$= 2(2 + 1 + 2 - 2)$

$\boxed{L_4 = 6}$

c. $M_4 = 2[(f(1) + f(3) + f(5) + f(7)]$

$= 2(3 + 2 + 1 - 1)$

$\boxed{M_4 = 10}$

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COMET

7) Since $f(x)$ is increasing, lower limit is L_5

$$L_5 = 5(f(0) + f(5) + f(10) + f(15) + f(20))$$

$$= 5(-42 - 37 - 25 - 6 + 15)$$

$$\boxed{L_5 = -475}$$

Upper limit is R_5

$$R_5 = 5(f(5) + f(10) + f(15) + f(20) + f(25))$$

$$= 5(-37 - 25 - 6 + 15 + 36)$$

$$\boxed{R_5 = -85}$$

$$\therefore \boxed{-475 \le \int_0^{25} f(x)\,dx \le -85}$$

11) $\Delta x = \frac{1-0}{5} = .2 \qquad \int_0^1 \sin(x^2)\,dx$

$x_0 = 0,\ x_1 = .2,\ x_2 = .4,\ x_3 = .6,\ x_4 = .8,\ x_5 = 1.0$

$$M_5 = .2(f(.1) + f(.3) + f(.5) + f(.7) + f(.9))$$

$$= .2(\sin(.1^2) + \sin(.3^2) + \sin(.5^2) + \sin(.7^2) + \sin(.9^2))$$

$$\boxed{M_5 \approx .3084}$$

16) Calculator Program

34) a. $\boxed{\int_0^2 g(x)\,dx = \frac{1}{2}\cdot 4\cdot 2 = 4}$

b. $\boxed{\int_2^6 g(x)\,dx = -\frac{1}{2}\pi(2^2) = -2\pi}$

c. $\int_0^7 g(x)\,dx = \int_0^2 g(x)\,dx + \int_2^6 g(x)\,dx + \int_6^7 g(x)\,dx$

$$= 4 - 2\pi + \frac{1}{2}$$

$$\boxed{\int_0^7 g(x)\,dx = 4.5 - 2\pi}$$

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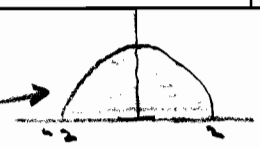
3-0137 — 200 SHEETS — FILLER
COMET

36) $\int_{-2}^{2} \sqrt{4-x^2}\, dx$



$f(x) = \sqrt{4-x^2}$ is upper half of a circle of radius 2 centered at 0,0

$\therefore \int_{-2}^{2} \sqrt{4-x^2}\, dx$ is area under this semicircle

$= \frac{\pi 2^2}{2} = \boxed{2\pi}$

49) $\int_0^9 f(x)\, dx = 37$ & $\int_0^9 g(x)\, dx = 16$

$\int_0^9 [2f(x) + 3g(x)]\, dx = \int_0^9 2f(x)\, dx + \int_0^9 3g(x)\, dx$

$= 2\int_0^9 f(x)\, dx + 3\int_0^9 g(x)\, dx$

$= 2 \cdot 37 + 3 \cdot 16$

$= \boxed{122}$