5.4

55 $\cancel{\int_a^x f(t)\,dt} + K = \int_b^x f(t)\,dt$

$-\cancel{\int_a^x f(t)\,dt} \qquad - \int_a^x f(t)\,dt$

$$K = \int_b^x f(t)\,dt - \int_a^x f(t)\,dt$$

$$= \int_b^x f(t)\,dt + \int_x^a f(t)\,dt$$

$$= \int_b^a f(t)\,dt$$

55 & 56

$$K = \int_2^{-1} (x^2 - 3x + 1)\,dx$$

$$= \Big|_2^{-1} \tfrac{1}{3}x^3 - \tfrac{3}{2}x^2 + x$$

$$\left[\tfrac{1}{3}(-1)^3 - \tfrac{3}{2}(-1)^2 + (-1)\right] - \left[\tfrac{1}{3}(2)^3 - \tfrac{3}{2}(2)^2 + 2\right]$$

$$-\tfrac{1}{3} - \tfrac{3}{2} - 1 - \tfrac{8}{3} + 6 - 2$$

$$\cancel{-3 - 1 + 6 - 2} - \tfrac{3}{2}$$

$$-\tfrac{3}{2}$$

[redacted] 5.4

[redacted] (17) $y = \int_{\sqrt{x}}^{0} \sin$

(39) $\int_{-1}^{1} (r+1)^2 \, dr$

$\int_{-1}^{1} (r^2 + 2r + 1) \, dr$

$\Big|_{-1}^{1} \frac{1}{3}r^3 + r^2 + r$

$\left[\frac{1}{3}(1)^3 + 1^2 + 1\right] - \left[\frac{1}{3}(-1)^3 + (-1)^2 + -1\right]$

$\frac{1}{3} + 1 + 1 + \frac{1}{3} \cancel{-1} \cancel{+1}$

$2\,{}^{2}/_{3}$

[redacted]

(27) $(6 - \ln 3) - (1 - \ln .5)$

$5 - \ln 3 + \ln .5$

$5 - (\ln 3 - \ln .5)$

$5 - \ln\left(\frac{3}{.5}\right)$

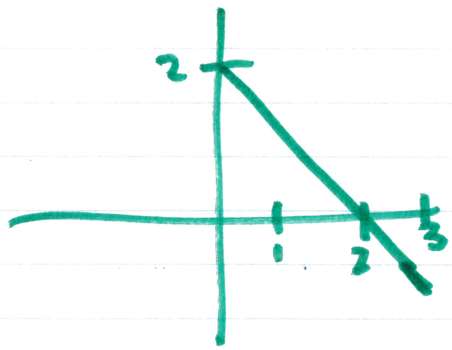
$5 - \ln 6$

~~5.3~~

~~(11) Find the value(s) of c guaranteed by the MVT for $y = x^2 - 1$ on the interval $[0, \sqrt{3}]$.~~

5.4

(41) $y = 2 - x \quad [0, 3]$

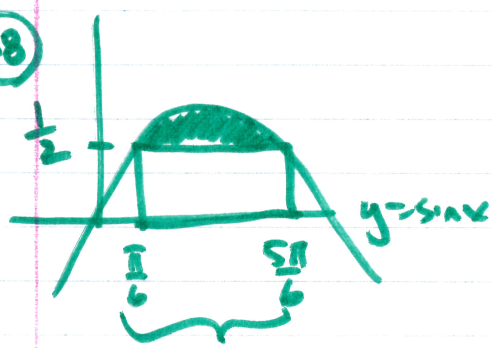


$$\int_0^2 (2-x)\,dx + \left| \int_2^3 (2-x)\,dx \right|$$

$$2 + \left| -\frac{1}{2} \right|$$

$$2 + \frac{1}{2} = \boxed{\frac{5}{2}}$$

(48)

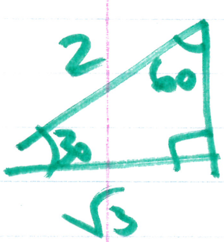


$$\int_{\frac{\pi}{6}}^{\frac{5\pi}{6}} \sin x \, dx$$

$$\Big|_{\frac{\pi}{6}}^{\frac{5\pi}{6}} -\cos x$$

$$-\cos x\left(\frac{5\pi}{6}\right) - -\cos\left(\frac{\pi}{6}\right)$$

$$\frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2} = \sqrt{3}$$



$\frac{4\pi}{6} \cdot \frac{1}{2}$

$\frac{2\pi}{6}$

S	A
T	C

$$\boxed{\sqrt{3} - \frac{\pi}{3}}$$

5.4

27 $\int_{1/2}^{3}\left(2-\frac{1}{x}\right)dx$

$\left.2x-\ln|x|\right|_{1/2}^{3}$

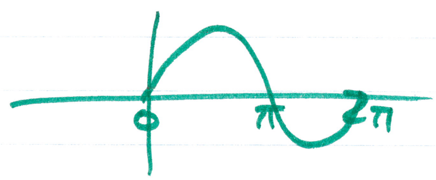
$\left[2(3)-\ln 3\right]-\left[2\left(\tfrac{1}{2}\right)-\ln\tfrac{1}{2}\right]$

$6-\ln 3-1+\ln\frac{1}{2}$ $\quad -\ln 2$

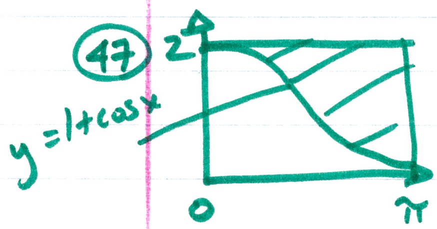
$5-\ln 3-\ln 2$

$5-(\ln 3+\ln 2)$

$\boxed{5-\ln 6}$



47



AREA OF RECTANGLE: 2π

AREA UNDER CURVE: $\int_0^{\pi}(1+\cos x)\,dx$

$\left.x+\sin x\right|_0^{\pi}$

$\left[\pi+\overset{0}{\sin\pi}\right]-\left[\cancel{0+\sin 0}\right]$

π

$2\pi-\pi=\pi$

55 $\cancel{\int_a^x f(t)\,dt}+K=\int_b^x f(t)\,dt$

$\cancel{-\int_a^x f(t)\,dt}$ $\quad -\int_a^x f(t)\,dt$

$K=\int_b^x f(t)\,dt-\int_a^x f(t)\,dt$

$=\int_b^x f(t)\,dt+\int_x^a f(t)\,dt$

$=\int_b^a f(t)\,dt$

$\int_2^{-1}(x^2-3x+1)\,dx$

$\left.\frac{1}{3}x^3-\frac{3}{2}x^2+x\right|_2^{-1}$

$\left[\frac{1}{3}(-1)^3-\frac{3}{2}(-1)^2+(-1)\right]-\left[\frac{1}{3}(2)^3-\frac{3}{2}(2)^2+2\right]$

$-\cancel{\frac{1}{3}}-\frac{3}{2}-1-\cancel{\frac{8}{3}}+6-2$

$-\cancel{3}+\cancel{3}\ \boxed{-\frac{3}{2}}$

5.4

61 $f(x) = 2 + \int_0^x \frac{10}{1+t}\,dt$, @ $x=0$

$f(0) = 2 + \int_0^0 \frac{10}{1+t}\,dt$

$(0,2)$

$f'(x) = \frac{10}{1+x}$

$f'(0) = \frac{10}{1+0} = 10$

$L(x) = f(a) + f'(a)(x-a)$

$= 2 + 10\,(x-0)$

$\boxed{L(x) = 2 + 10x}$