

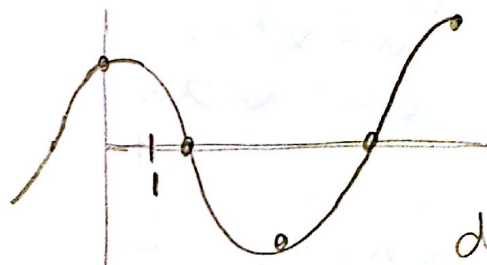
Prob Set 4

1)
$$B \int (\sec^2 x - 2) dx = \tan x - 2x + C$$

2)
$$C \quad F(x) = \int_0^{x^2} \sqrt{t+3} dt$$

$$F'(x) = \sqrt{x^2+3} \cdot 2x$$

3)
$$D \quad A = \int_0^1 \cos x dx$$



decreasing
cc ↓



LRAM above
RRAM below



TRAM below

4)
$$A \int_{-3}^4 f(x) dx =$$

$$-\frac{1}{4} \pi (2)^2 = -\pi$$

$$\frac{1}{2} (1)(1) = \frac{1}{2}$$

$$2(1) = 2$$

$$-\frac{1}{4} \pi (1)^2 = -\frac{\pi}{4}$$

$$-\frac{4\pi}{4} - \frac{\pi}{4} + \frac{8}{4} + \frac{2}{4}$$

$$\frac{10 - 5\pi}{4}$$

5) $\frac{1}{2}(1)(4 + 2(21) + 2(56) + 2(115) + 204)$
 C $f(0) = 4$ $= 296$
 $f(1) = 21$
 $f(2) = 56$
 $f(3) = 115$
 $f(4) = 204$

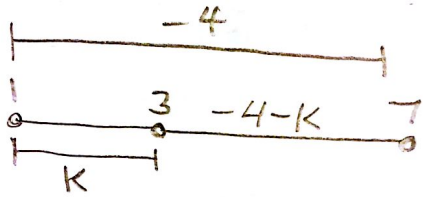
6) $\int \frac{2x}{x^2-1} dx$ $u = x^2 - 1$
 $du = 2x dx$
 B $\int \frac{1}{u} du = \ln|u| + C$
 $0 = \ln|2^2 - 1| + C$
 $0 = \ln 3 + C$ $C = -\ln 3$
 $\ln|x^2 - 1| - \ln 3$

7) $f(c) = \frac{1}{3-1} \int_1^3 2 \ln x dx$
 C $\frac{1}{2} \cdot 2 \int_1^3 \ln x dx$
 $= \int_1^3 \ln x dx$
 $f(c) = 1.296 = 2 \ln x$
 $0.648 = \ln x$
 $x = 1.912$

$$f(c) = \frac{1}{10} \int_0^{10} x^2 dx = \frac{100}{3} = f(c)$$

$$\frac{100}{3} = x^2$$

9)
D



$$\int_3^7 (x + f(x)) dx$$

$$- \int_7^3 (x + f(x)) dx$$

$$- \left(\left. \frac{x^2}{2} \right|_3^7 + (-4-k) \right)$$

$$- \left[\left(\frac{49}{2} - \frac{9}{2} \right) + (-4-k) \right]$$

$$20 + -4 - k$$

$$- (16 - k)$$

$$-16 + k$$

10) $v(t) = 2t - 3$

B $t = 2, s(t) = -10$
 $s(5) =$

$$\int (2t - 3) dt = t^2 - 3t + C$$

$$-10 = 2^2 - 3(2) + C$$

$$-10 = 4 - 6 + C$$

$$-10 = -2 + C$$

$$-8 = C$$

$$s(t) = t^2 - 3t - 8$$

$$s(5) = 25 - 15 - 8$$

$$= 2$$

11) $F(x) = \int_0^x \frac{10}{1+e^t} dt$

D

$$F'(x) = \frac{10}{1+e^x} = \frac{10}{1+1} = 5$$

I true

$$\int_0^2 \frac{10}{1+e^t} dt \approx 5.662$$

$$\int_0^6 \frac{10}{1+e^t} dt \approx 6.907$$

II true

$$F'(x) = f(x)$$

$$F''(x) = f'(x)$$

III false

12) $\frac{1}{6-0} \cdot \int_0^6 v(t) dt = \frac{1}{6} \cdot \left(\frac{1}{4} \pi (4)^2 - \frac{1}{2} (2)(2+1) \right)$

$$\frac{1}{6} (4\pi - 3)$$

$$\frac{4\pi - 3}{6}$$

13) -2

C

14)

0	1	2	3	4	5	6
	5		9		5	

D

$$2(5) + 2(9) + 2(5) = 38$$

15)

$$\frac{1}{2} (1)(0 + 2(5) + 2(8) + 2(9) + 2(8) + 2(5) + 0) = 35$$

C