

CH. 5.2 DEFINITE INTEGRAL

DAY 85

(B)

p. 286 #9, 13-15, 19, 25, 28-30, 32

(9)  $\int_0^1 \sin(t^2) dt = 0.310$

MATH 9:  $\int_a^b ( ) d\Box$

(13)  $\int_0^{15} f(x) dx$

x	0	3	6	9	12	15
f(x)	50	48	44	36	24	8

LHS =  $3(50 + 48 + 44 + 36 + 24) = 3(202) = 606$

RHS =  $3(48 + 44 + 36 + 24 + 8) = 3(160) = 480$

AVG =  $\frac{606 + 480}{2} = 543$

(14)  $\int_3^7 \frac{1}{1+x} dx$

n=5

x	$\frac{15}{5}$ 3	$\frac{19}{5}$ $\frac{19}{5}$	$\frac{23}{5}$ $\frac{23}{5}$	$\frac{27}{5}$ $\frac{27}{5}$	$\frac{31}{5}$ $\frac{31}{5}$	$\frac{35}{5}$ 7
f(x) = $\frac{1}{1+x}$	$\frac{1}{4}$	$\frac{5}{24}$	$\frac{5}{28}$	$\frac{5}{32}$	$\frac{5}{36}$	$\frac{1}{8}$

RHS =  $\frac{4}{5} \left( \frac{5}{24} + \frac{5}{28} + \frac{5}{32} + \frac{5}{36} + \frac{1}{8} \right) = \frac{4}{5} \left( \frac{1627}{2016} \right) = \frac{1627}{2520} \approx 0.64563$

(15)  $\int_0^{20} f(x) dx$

LHS =  $4(0 + 2 + 2.8 + 3.5 + 4) = 4(12.3) = 49.2$

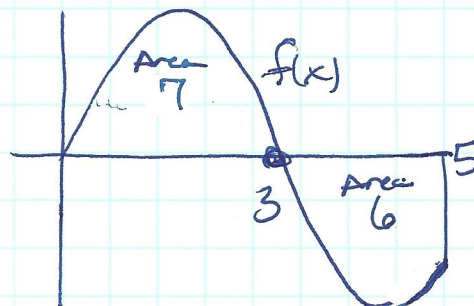
RHS =  $4(2 + 2.8 + 3.5 + 4 + 4.4) = 4(16.7) = 66.8$

AVG =  $\frac{49.2 + 66.8}{2} = 58$

x	0	4	8	12	16	20
f(x)	0	2	2.8	3.5	4	4.4

(19) a) Area =  $+7 + 6 = 13$

b)  $\int_0^5 f(x) = 7 - 6 = 1$



(25)  $y = 2 \cos\left(\frac{t}{10}\right) \quad t \in [1, 2]$

$\int_1^2 2 \cos\left(\frac{t}{10}\right) = 1.976718$   
 $= 1.976 \text{ or } 1.977$

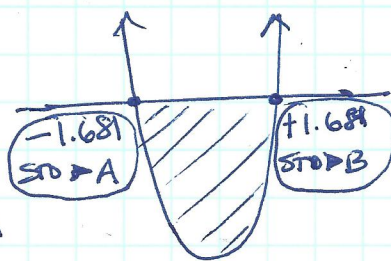
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(28)  $y = x^4 - 8$

You must find the limits of integration



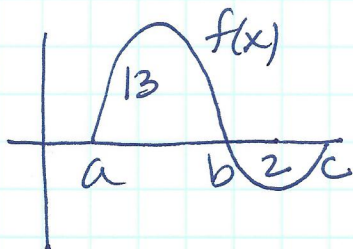
$$\int_A^B (x^4 - 8) dx$$

$$= -21.52695$$

$$= -21.526 \text{ or}$$

$$= -21.527$$

(29)



a)  $\int_a^b f(x) dx = 13$

b)  $\int_b^c f(x) dx = -2$

c)  $\int_a^c f(x) dx = 13 - 2 = 11$

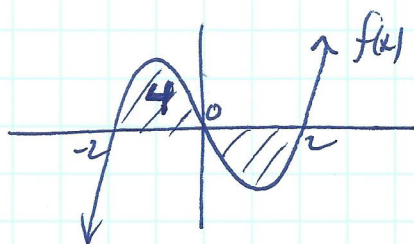
d)  $\int_a^c |f(x)| dx = 13 + 2 = 15$

(30)  $\int_{-2}^0 f(x) dx = 4$

a)  $\int_0^2 f(x) dx = -4$

b)  $\int_{-2}^2 f(x) dx = 0$

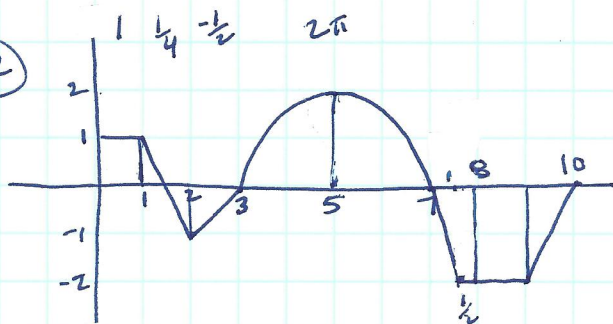
c)  $\int_{-2}^2 |f(x)| dx = 8$



odd function

so  $\int_{-2}^2 f(x) dx = -4$

(32)



a)  $\int_0^2 f(x) dx = 1 + \frac{1}{4} - \frac{1}{4} = 1$

b)  $\int_3^7 f(x) dx = \frac{1}{2} \pi (2)^2 = 2\pi$

c)  $\int_2^7 f(x) dx = -\frac{1}{2} + 2\pi$

d)  $\int_5^8 f(x) dx = \pi - \frac{3}{2}$

$$= \int_5^7 f(x) dx + \int_7^8 f(x) dx$$

$$= \pi - \frac{3}{2}$$

$$A_{\text{TRAP}} = \frac{1}{2}(h)(b_1 + b_2)$$

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