Good afternoon: when the bell rings, we will randomize and look over a fe
disparate topics we've covered in the last few weeks in preparation for the assessment Monday.

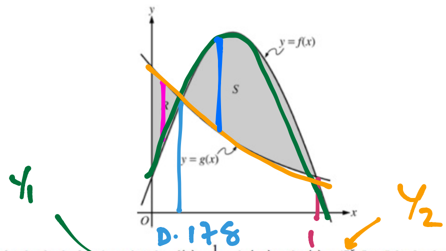
You will have time in class to work on the practice :)

Find intersection points
Enter functions into y1 and y2
Graph (adjust zoom if needed), then 2nd, TRACE, INTERSECT
move cursor to point you want, hit enter 3 times

2005AB1

calc ok

Function variables
Hit VARS, then Y-vars menu, then 1
or
ALPHA then TRACE



Let f and g be the functions given by $f(x) = \frac{1}{4} + \sin(\pi x)$ and $g(x) = 4^{-x}$. Let R be the shaded region in the first quadrant enclosed by the y-axis and the graphs of f and g, and let S be the shaded region in the first quadrant enclosed by the graphs of f and g, as shown in the figure above.

(a) Find the area of R.

(b) Find the area of S.

math 9

$R = \int_0^{.178} g(x) - f(x)\, dx \rightarrow \boxed{\int_0^{.178} Y_2 - Y_1\, dx} \rightarrow \boxed{.064}$

$S = \int_{.178}^{1} f(x) - g(x)\, dx \rightarrow \boxed{\int_{.178}^{1} Y_1 - Y_2\, dx} \rightarrow \boxed{0.410}$

formula: $\underbrace{\frac{1}{b-a}}_{\text{"\#" of values}} \underbrace{\int_a^b f(x)\,dx}_{\text{sum of the values}}$

Find the average value of $y = x^3$ on the interval [2,8].

$$\frac{1}{8-2}\int_2^8 x^3\,dx$$

$$\frac{1}{6}\left[\frac{1}{4}x^4\right]_2^8$$

$$\frac{1}{6}\left[\frac{1}{4}(8)^4 - \frac{1}{4}(2)^4\right]$$

$$\frac{1}{6}[1024 - 4]$$

$$\frac{1}{6}[1020]$$

$$\frac{1020}{6} \rightarrow \frac{510}{3} = 170$$

$$\begin{array}{r} 170 \\ 3\,\overline{)510} \\ -3 \\ \hline 21 \end{array}$$

Interpreting Average Value + Net Change

2013AB1 calc ok (modified)

On a certain workday, the rate, in tons per hour, at which unprocessed gravel arrives at a gravel processing plant is modeled by $G(t) = 90 + 45\cos\left(\frac{t^2}{18}\right)$, where t is measured in hours and $0 \le t \le 8$. At the beginning of the workday $(t = 0)$, the plant has 500 tons of unprocessed gravel. During the hours of operation, $0 \le t \le 8$, the plant processes gravel at a constant rate of 100 tons per hour.

a. Using correct units, explain the meaning of $\frac{1}{5}\int_2^7 G(t)\,dt$. Then find its value.

b. How much unprocessed gravel is at the plant at the end of the work day (t=8)?

a.) This represents the average rate at which gravel arrives in tons per hour from t=2 to t=7.

via math-9 $\rightarrow$ 101.940 tons per hour

b.) $A(t) = 500 + \int_0^t 90 + 45\cos\left(\frac{x^2}{18}\right)dx - 100t$

Initial amt. Accumulation of arrivals. minus processed amt

$A(8) = 500 + \int_0^8 90 + 45\cos\left(\frac{x^2}{18}\right)dx - 100(8)$

$\downarrow$ math-9

$500 + 825.551 - 800$

$= \boxed{525.551 \text{ tons}}$

2014AB4 no calc

Trapezoid Rule from a Table + Net Change

Train A runs back and forth on an east-west section of railroad track. Train A's velocity, measured in meters per minute, is given by a differentiable function $v_A(t)$, where time t is measured in minutes. Selected values for $v_A(t)$ are given in the table above.

t (minutes)	0	2	5	8	12
$v_A(t)$ (meters/minute)	0	100	40	−120	−150

3 3 4

$A(0) = 300$ +

(c) At time $t = 2$, train A's position is 300 meters east of the Origin Station, and the train is moving to the east. Write an expression involving an integral that gives the position of train A, in meters from the Origin Station, at time $t = 12$. Use a trapezoidal sum with three subintervals indicated by the table to approximate the position of the train at time $t = 12$.

$$A(12) = A(2) + \underbrace{\int_2^{12} v(t)\,dt}_{\text{displacement}}$$

$$300 + \frac{1}{2}(100+40)(3) + \frac{1}{2}(40+{}^{-}120)(3) + \frac{1}{2}(-120+{}^{-}150)4$$

$$300 + \frac{1}{2}(140)(3) + \frac{1}{2}(-80)(3) + \frac{1}{2}(-270)4$$

$$300 + (70)(3) - (40)(3) - 2(270)$$

$$300 + 210 - 120 - 540$$

$$510 - 120 - 540 \Rightarrow 490 - 540 = -150$$

150 m West

HW

do the practice assessment, study solutions, study help videos

need extra practice?

problems in book

I-A4b area between curves: p. 442: much of the page is good
I-U7 prop of definite integrals: p. 274 #41-44
I-U4: FTC algebra: p. 290 81-92
I-U9: FTC graphically: p.290 73-74; p. 274 #47-48
I-A7b: Net Change: p. 291 #103-104
I-A7a: Average Value:p. 288: #51-55
I-U3a: LRAM/RRAM: p. 263 #33-36
I-U3c: Riemann Sum from Table: p. 274 #45-46
I-A1a: Basic Antiderivatives: p.312 #1-8