

3 Strikes Yer Out!

1ST TRY... 3 POINTS
2ND TRY... 2 POINTS
3RD TRY... High five!

Worksheet A - 8.1



Group Members:

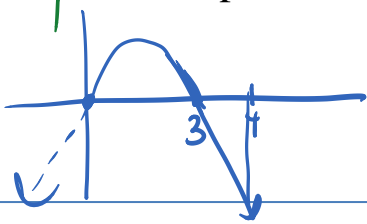
KEY

1. The velocity of a particle moving along the x-axis in cm/sec is given by $v(t) = 3t - t^2$ on the interval $0 \leq t \leq 4$. (No Calculator)

$$3t - t^2 = 0$$

$$t(3 - t) = 0$$

- a) Find the displacement of the particle at $t = 4$ sec.



$$\int_0^4 (3t - t^2) dt = \left[\frac{3}{2}t^2 - \frac{1}{3}t^3 \right]_0^4$$

$$= \left(\frac{3}{2}(16) - \frac{1}{3}(64) \right) - 0 = 24 - \frac{64}{3}$$

$$= \frac{72}{3} - \frac{64}{3} = \frac{8}{3} \text{ cm}$$

- b) Find the total distance traveled from $t = 0$ sec. to $t = 4$ sec.

$$\int_0^3 (3t - t^2) dt = \left[\frac{3}{2}t^2 - \frac{1}{3}t^3 \right]_0^3 = \frac{3}{2} \cdot 3^2 - \frac{1}{3} \cdot 3^3 - 0$$

$$= \frac{27}{2} - 9 = \frac{27}{2} - \frac{18}{2} = \frac{9}{2}$$

$$\int_3^4 (3t - t^2) dt = \left[\frac{3}{2}t^2 - \frac{1}{3}t^3 \right]_3^4 = \left(\frac{3}{2}(16) - \frac{1}{3} \cdot 4^3 \right) - \left(\frac{3}{2} \cdot 3^2 - \frac{1}{3}(3)^3 \right)$$

$$= 24 \frac{6}{6} - \frac{64 \cdot 2}{3 \cdot 2} - \frac{9 \cdot 3}{2 \cdot 3} - \frac{144}{6} - \frac{128}{6} - \frac{27}{6}$$

$$\text{Total distance} = \frac{9}{2} + \frac{11}{6} = \frac{27}{6} + \frac{11}{6} = \frac{38}{6} \text{ cm} = \frac{19}{3} \text{ cm}$$

- c) Find the final position of the particle at $t = 4$ sec if $s(0) = 3$ cm.

$$\text{Final pos.} = 3 + \frac{8}{3} = \frac{17}{3} \text{ cm}$$

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Worksheet B - 8.1

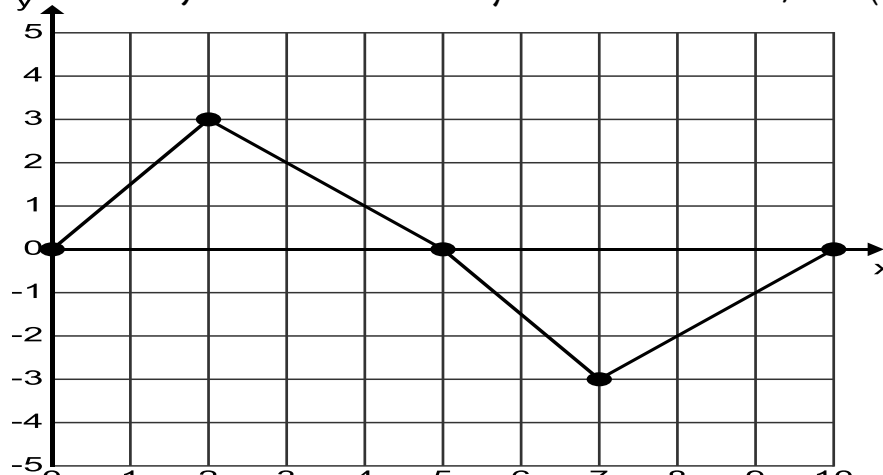


Group Members:

1. The rate at which water is pumped out of a pumping station is given by $r(t) = 5.01 + 1.02^t$ in millions of gallons per month from Jan. 1st, 2000. How much total water has been pumped out of the station on April 1st, 2000? (Calculator OK)

$$\text{Total} = \int_0^3 (5.01 + 1.02^t) dt \approx \boxed{18.121 \text{ million gallons}}$$

2. Given the graph of the velocity of a dog moving back and forth on a rope in a yard (that is connected to his leash) where the velocity is measured in ft/sec. (No Calc.)



- a) What is the displacement of the dog in the 10 seconds?

$$\int_0^{10} v(t) dt = \frac{1}{2} \cdot 5 \cdot 3 - \frac{1}{2} \cdot 5 \cdot 3 = \boxed{0 \text{ ft}}$$

- b) What is the total distance traveled by the dog in the 10 seconds?

$$\int_0^{10} |v(t)| dt = \frac{1}{2} \cdot 5 \cdot 3 + \frac{1}{2} \cdot 5 \cdot 3 = \boxed{15 \text{ ft}}$$

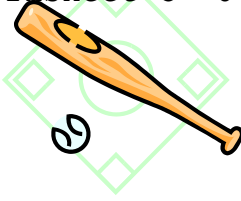
- c) What is the dog's acceleration at $t = 3$ seconds? (Give correct units.)

$$a(3) = \boxed{-1 \text{ ft/sec}^2}$$

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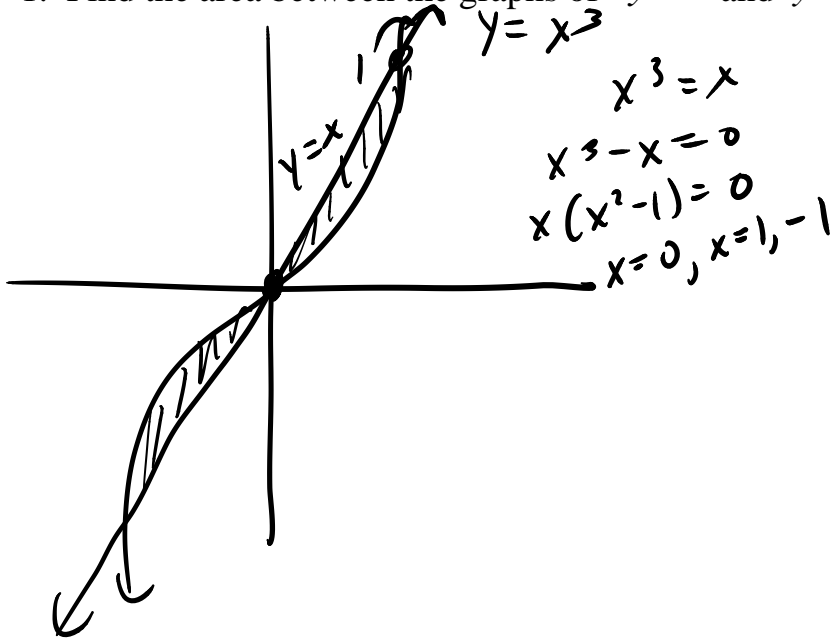
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Worksheet C -8.2



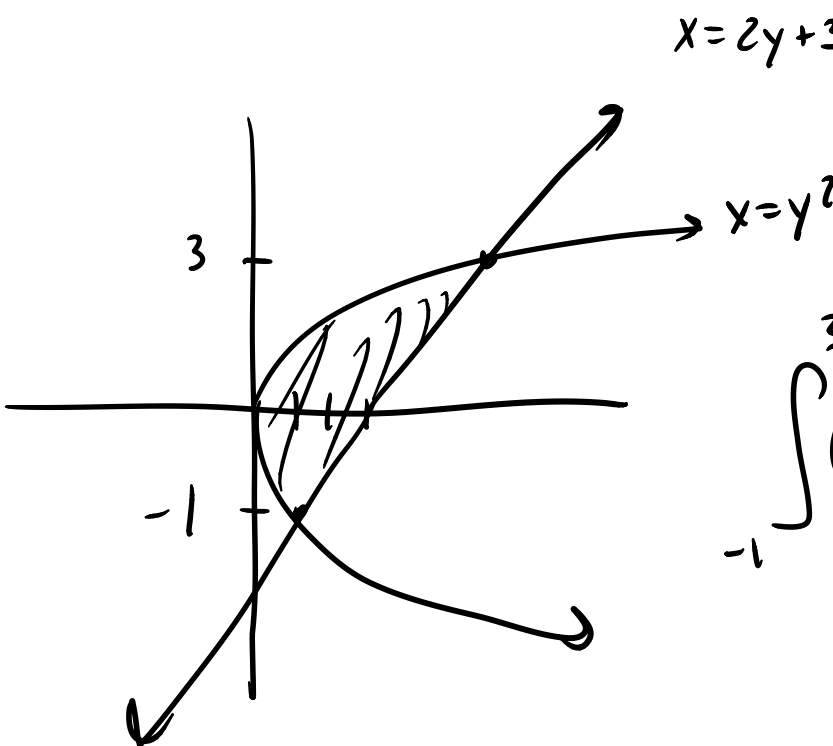
Group Members:

1. Find the area between the graphs of $y = x$ and $y = x^3$. (No Calculator)



$$2 \int_0^1 (x - x^3) dx$$
$$2 \left[\frac{1}{2}x^2 - \frac{1}{4}x^4 \right]_0^1$$
$$2 \left[\frac{1}{2} - \frac{1}{4} - 0 \right] = 2 \cdot \frac{1}{4} = \boxed{\frac{1}{2}}$$

2. Find the area between the graphs of $x - 2y = 3$ and $x - y^2 = 0$. (No Calculator)



$$\int_{-1}^3 (2y + 3 - y^2) dy = \left[y^2 + 3y - \frac{1}{3}y^3 \right]_{-1}^3$$
$$= \left(3^2 + 3(3) - \frac{1}{3}3^3 \right) - \left(1 - 3 + \frac{1}{3} \right)$$

$$= 18 - 9 - (-2 + \frac{2}{3}) = 11 - \frac{2}{3}$$

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Worksheet D - 8.2



Group Members: = $\left| \frac{32}{3} \text{ or } 10\frac{2}{3} \right|$

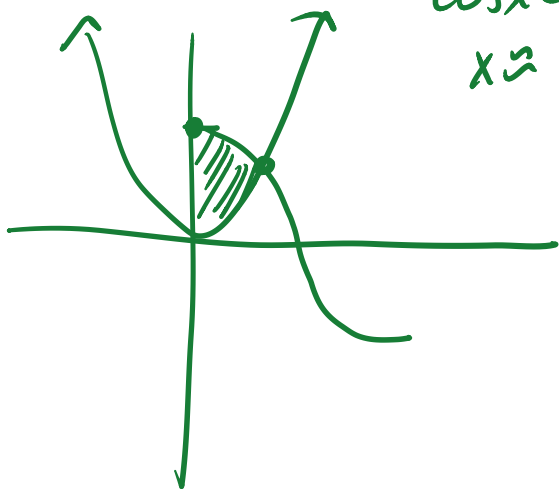
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1. Find the area bounded by the y-axis, the parabola $y = x^2$, and the graph of $y = \cos x$.

(Calculator OK)

$$\cos x = x^2$$

$$x \approx .824 \leftarrow A$$



$$\int_0^A (\cos x - x^2) dx \approx \boxed{.547}$$

2. Find the area bounded by $y = x + 3$ and $y = e^x - 1$.

$$y = e^x - 1$$

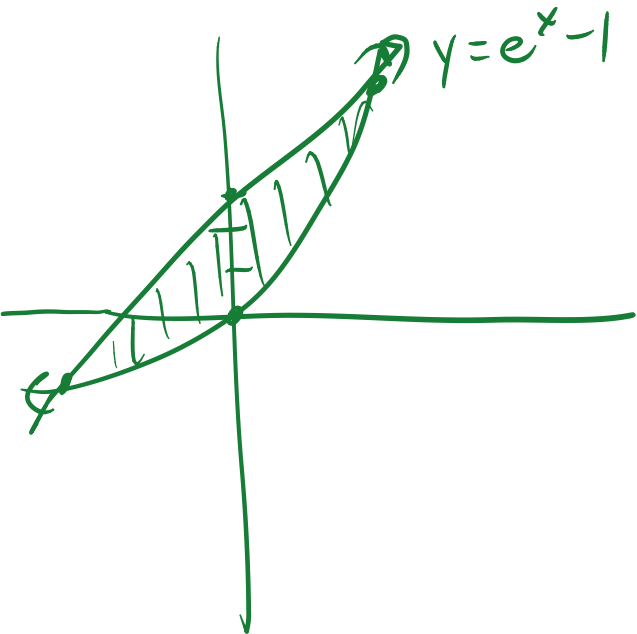
$$e^x - 1 = x + 3$$

$$x \approx 1.749, -3.981 \leftarrow B$$

A \rightarrow

$$\int_B^A (x + 3 - (e^x - 1)) dx$$

$$\approx \boxed{10.795}$$



Names:

Worksheet	1 st Attempt – 3 points	2 nd Attempt – 2 points	3 rd Attempt – HIGH FIVE!
A			
B			
C			
D			
Total Points			

3 Strikes Yer Out Rules

- 1) Each worksheet has 2-4 problems. After you are done, bring up the one you finished for grading.
- 2) You must *work together* so that each group member is at the same pace.

****Note: Hitchhiking is illegal in Calculus!!****

- 3) When your **whole group** is finished with the worksheet, one person should bring **ALL** worksheets to check with me. Bring your *score sheet* with you!!

4) Scoring:

- If your group gets **ALL** problems correct the first time, you will receive 3 points (to be written on the score sheet).
- Otherwise, you will have to take your sheet, go back, and correct them....on the second time, you will receive 2 points.
-on the third time...it's a HIGH FIVE FOR YOU!!

Good Luck!!