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| **Student:** Cole Lamers<br>**Date:** 10/19/19 | **Instructor:** Viktoriya Shcherban<br>**Course:** Calc 1 11:30 AM / Internet (81749&81750) Shcherban | **Assignment:** 6.6 Moments and Centers of Mass |

1. Find the center of mass of a thin plate of constant density $\delta$ covering the region bounded by the parabola $y = 3x^2$ and the line $y = 12$.

The center of mass is located at $(\bar{x}, \bar{y}) =$ (0,7.2) .
(Simplify your answer. Type an ordered pair.)

2. Find the center of mass of a thin plate of constant density $\delta$ covering the given region.

The region bounded by the parabola $y = 6x - 6x^2$ and the line $y = -6x$

The center of mass is (1, − 3.6) . (Type an ordered pair.)

3. The region bounded by the curves $y = \pm \frac{6}{\sqrt{x}}$ and the lines $x = 1$ and $x = 4$ is revolved about the y-axis to generate a solid.

**a.** Find the volume of the solid.

**b.** Find the center of mass of a thin plate covering the region if the plate's density at the point (x,y) is $\delta(x) = \frac{1}{x}$.

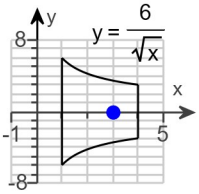
**c.** Sketch the plate and show the center of mass in your sketch.

**a.** The volume is $112\pi$ units cubed.
(Type an exact answer, using $\pi$ as needed.)

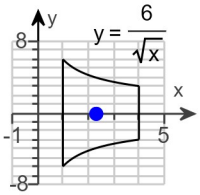
**b.** The center of mass is located at $\bar{x} =$ 2 , $\bar{y} =$ 0 .

**c.** Choose the correct sketch.

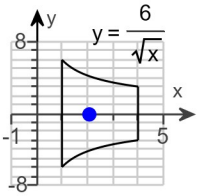
**A.**
C.M at (3,0)



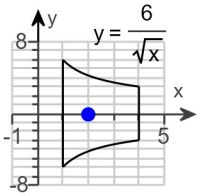

**B.**
C.M. at (7 / 3,0)




**C.**
C.M. at (3 **ln** 2,0)




**D.**
C.M at (2,0)




4. Using the fact that the centroid of a triangle lies at the intersection of the triangle's medians, which is the point that lies one-third of the way from each side toward the opposite vertex, find the centroid of the triangle whose vertices are (0,0), (5,0), and (0,11).

The centroid of the triangle is $(\bar{x},\bar{y})$, where $\bar{x} = \frac{5}{3}$ and $\bar{y} = \frac{11}{3}$ .

(Type integers or simplified fractions.)

5. Find the center of mass of a thin plate covering the region bounded below by the parabola $y = x^2$ and above by the line $y = x$ if the plate's density at the point $(x,y)$ is $\delta(x) = 7x$.

The center of mass is $(\bar{x},\bar{y}) = \left(\frac{3}{5},\frac{1}{2}\right)$. (Type an ordered pair. Simplify your answer.)