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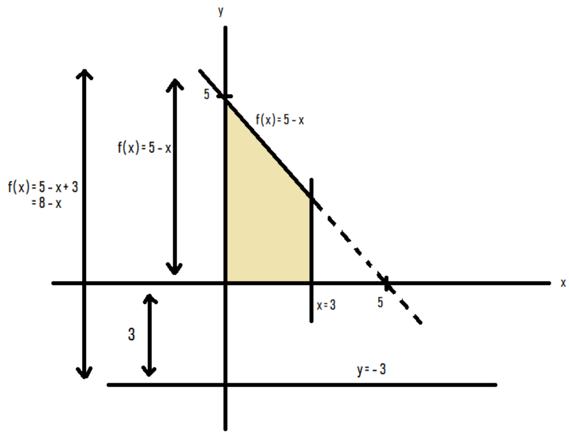
The objective of this question is to calculate the volume of solid generated by revolution of a planar region.

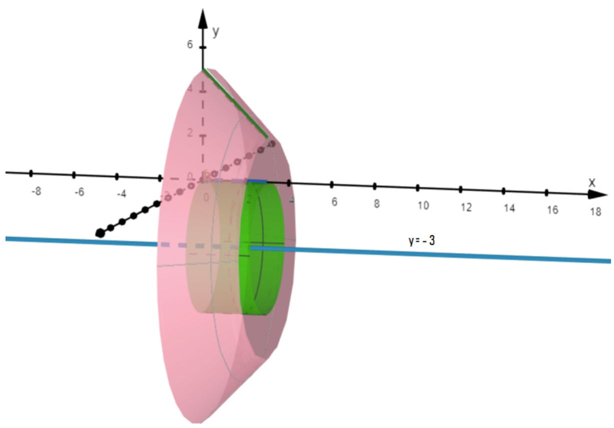


In this question, we are supposed to revolve the region around $y = -3$. Therefore, the equations have to be redefined by assuming that $y = -3$ is our new origin.

So, $f(x) = 8 - x$ is a straight line.

$g(x) = 3$ is a straight line.

According to the question, we are supposed to revolve the region around the line y=-3. On Revolving around the $y = -3$, a solid of revolution is obtained.



Remember that, the volume of the solid of revolution formed by revolving region around the x-axis is given by,

$\mathbf{V} = \pi \int_a^b f^2(x) - g^2(x)\, dx$, where $f(x)$ **is the upper curve** and $g(x)$ **is the lower curve** and $x \in [a, b]$.

In this case, the upper function is $f(x) = 8 - x$ and lower function is $g(x) = 3$ and $x \in [0, 3]$.

$$
\begin{aligned}
V &= \pi \int_a^b f^2(x) - g^2(x)\, dx \\
&= \pi \int_0^3 (8-x)^2 - 3^2\, dx \\
&= \pi \int_0^3 (8-x)^2 - \pi \int_0^3 3^2\, dx \\
&= \pi \left[\frac{(8-x)^3}{3}\right]_0^3 - \pi \Big[9x\Big]_0^3 \\
&= \pi \left(\frac{125}{3} - \frac{512}{3}\right) - 27\pi \\
&= 129\pi - 27\pi \\
&= 102\pi \text{ cubic units}
\end{aligned}
$$