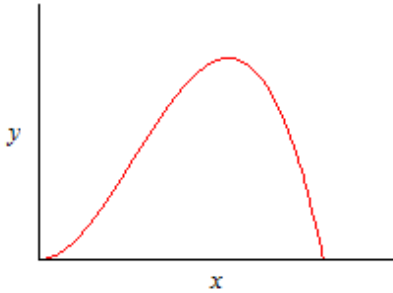


## Math 187 –Tutorial on Finding $dV$

Find an expression for the area  $dV$  of the solids of revolution using the method indicated.

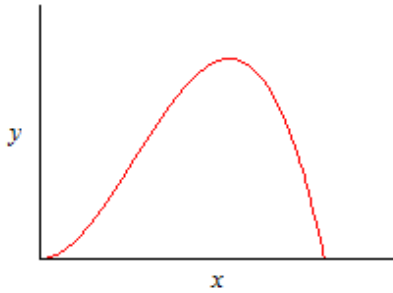
1. Disk: for the volume of revolution created by rotating about the  $x$ -axis the first-quadrant region under the curve  $y = 2x^2 - x^3$ .



2. Disk: for the volume of revolution created by rotating about the  $x$ -axis the first-quadrant region under the curve  $y = 4 - x^2$ .

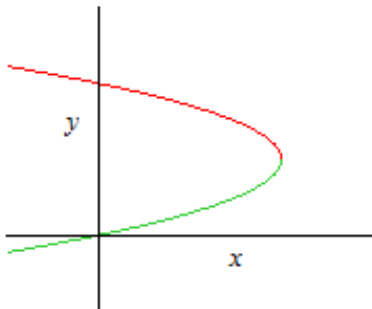
3. Disk: for the volume of revolution created by rotating about the  $y$ -axis the first-quadrant region under the curve  $y = 4 - x^2$ .

4. Shell: for the volume of revolution created by rotating about the  $y$ -axis the first-quadrant region under the curve  $y = 2x^2 - x^3$ .



5. Both Disk and Shell: for the volume of revolution created by rotating about the  $y$ -axis the region bounded by the curve  $y = \sqrt{x}$  and the lines  $x=0$  and  $y=3$ .

6. Choose the most appropriate method (disk or shell) and give  $dV$  for the volume of revolution created by rotating about the  $y$ -axis the region bounded by the curve  $x = 4y - y^2$  and the  $y$ -axis.



## Answers

1.  $dV = \pi(2x^2 - x^3)^2 dx$

2.  $dV = \pi(4 - x^2)^2 dx$

3.  $dV = \pi(4 - y)dy$

4.  $dV = 2\pi x(2x^2 - x^3)dx$

5.  $dV_{disk} = \pi y^4 dy$ ,  $dV_{shell} = 2\pi x(3 - \sqrt{x})dx$

6.  $dV_{disk} = \pi(4y - y^2)^2 dy$