6.2, 6.3, 10.1-10.3 Worksheet

August 11, 2021
Example
Find the volume of the solid obtained by revolving the region bounded by $2x = y^2$, $x = 0$, $y = 4$ about the $y$-axis.
Example

Find the volume of the solid obtained by revolving the region bounded by \( y = 4 - 2x, \ y = 0, \ x = 0 \) about \( x = -1 \).
Example
Find the volume of the solid obtained by revolving the region bounded by $xy = 1, y = 0, x = 1, x = 2$ about the $y$-axis.
Example
Find the volume of the solid obtained by revolving the region bounded by $x = 2y^2$, $x = y^2 + 1$ about $y = -2$. 
28. Match the parametric equations with the graphs labeled I–VI. Give reasons for your choices. (Do not use a graphing device.)

(a) \( x = t^4 - t + 1, \; y = t^2 \)
(b) \( x = t^2 - 2t, \; y = \sqrt{t} \)
(c) \( x = \sin 2t, \; y = \sin(t + \sin 2t) \)
(d) \( x = \cos 5t, \; y = \sin 2t \)
(e) \( x = t + \sin 4t, \; y = t^2 + \cos 3t \)
(f) \( x = \frac{\sin 2t}{4 + t^2}, \; y = \frac{\cos 2t}{4 + t^2} \)

I

II

III

IV

V

VI
Example

Graph the parametric curve described by \( x = 3t - t^3 \), \( y = 3t^2 \), find its horizontal and vertical tangents and find its length.
46. Match the polar equations with the graphs labeled I–VI. Give reasons for your choices. (Don’t use a graphing device.)

(a) \( r = \sqrt{\theta} \), \( 0 \leq \theta \leq 16\pi \)  
(b) \( r = \theta^2 \), \( 0 \leq \theta \leq 16\pi \)  
(c) \( r = \cos(\theta/3) \)  
(d) \( r = 1 + 2 \cos \theta \)  
(e) \( r = 2 + \sin 3\theta \)  
(f) \( r = 1 + 2 \sin 3\theta \)