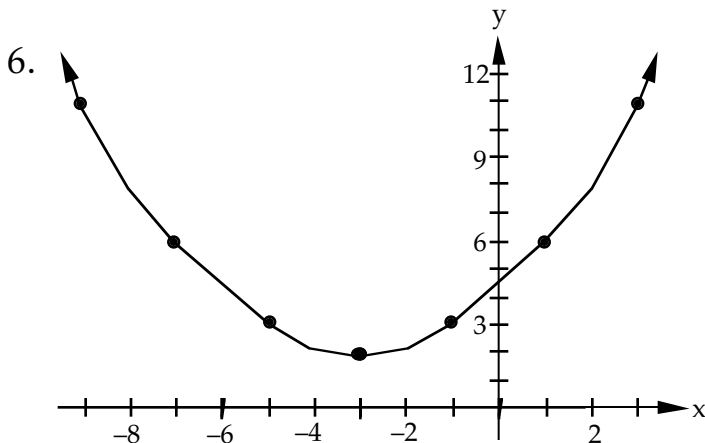


Problem Set 107

2a. $v(t) = 3t^2 - 12t + 9$; $a(t) = 6t - 12$
 b. $v(4) = 9$; $a(3) = 6$

4. $\frac{4}{3}\pi \text{ units}^3$



$$\frac{dy}{dx} = \frac{x+3}{2}$$

$$y = \frac{1}{4}x^2 + \frac{3}{2}x + \frac{17}{4}$$

8. $\frac{\sqrt{5}}{2} \angle 26.565^\circ,$
 $\frac{\sqrt{5}}{2} \angle \pm 33.435^\circ$
 $-\frac{\sqrt{5}}{2} \angle \pm 153.435^\circ, \quad -\frac{\sqrt{5}}{2} \angle \pm 206.565^\circ$

10. $x^2 + y^2 - y = 0$

12. Converges to 0

14. $T_6 = 0.196$

16. $\delta = \frac{4}{3}\epsilon$

18. 0

20. $c = \arccos \frac{\sqrt{\pi}}{2}$

22. using Newton's: $x = 1.14651777$

24.
$$\lim_{h \rightarrow 0} \frac{\sin(x+h) - \sin x}{h}$$

$$= \lim_{h \rightarrow 0} \frac{\sin x \cosh + \cos x \sinh - \sin x}{h}$$

$$= \lim_{h \rightarrow 0} \frac{\sin x(\cosh - 1) + \cos x \sinh}{h}$$

$$= \sin x \lim_{h \rightarrow 0} \frac{\cosh - 1}{h} + \cos x \lim_{h \rightarrow 0} \frac{\sinh}{h}$$

$$= (\sin x)(0) + (\cos x)(1)$$

$$= \cos x$$