Answers wir 5 Review Problems

1. \( \theta = 172^\circ \) (approximately)

2. \( x = 12 + 14t, \ y = 3 + 4t \)

3. Graph is the parabola \( x = y^2 \);
   Tangent vector: \( \langle 4, 1 \rangle \), Unit tangent: \( \left( \frac{4}{\sqrt{17}}, \frac{1}{\sqrt{17}} \right) \)

4. approximately \( 41^\circ \)

5. a.) \( v(t) = 12t^2 - 30t + 12 \), \( a(t) = 24t - 30 \)
   b.) \( a(1/2) = -18 \text{ ft/s}^2 \), \( a(2) = 18 \text{ ft/s}^2 \)

6. \( \frac{81}{8} \)

7. \( -2^{83} \cos 2x \)

8. position: \( \langle 0, -1 \rangle \)
   velocity: \( \langle -2, 0 \rangle \); speed: 2;
   acceleration: \( \langle 0, 4 \rangle \)
   The graph is the circle \( x^2 + y^2 = 1 \)

9. a.) \( y = 2 \)
   b.) Horizontal: \( (-4, 2) \) and \( (-2, -2) \); Vertical: \( (0, 0) \) and \( (-4, 2) \)

10. \( m = \frac{6}{7} \)

11. \( 250\sqrt{3} \text{ km/hr} \)

12. \( \frac{1}{8\pi} \text{ cm/min} \)

13. The area is increasing at a rate of 1 square foot/second

14. 7.5 cubic inches/second

15. \( \frac{\sqrt{2}}{5} \text{ radians/second} \)