Answer Key

Math 1155
Spring 2003 Final Exam

1. a) \(\sin 67.5^\circ = \sqrt{\frac{1 - \left(\frac{\sqrt{2}}{2}\right)}{2}}\) or \(\sqrt{\frac{2 + \sqrt{2}}{2}}\)
   b) \(\sin \theta = \frac{5}{\sqrt{26}}\) or \(\frac{5\sqrt{26}}{26}\)

2. \(\frac{1}{4} \ln 4 \approx 0.347\) hour (20.8 minutes)

3. \(x^2 + (y - 3)^2 = 9\); center at (0, 3), radius is 3

4. zeroes are \(-1\), 1, \(-1 - \sqrt{2}\), \(-1 + \sqrt{2}\)

5. see solution set

6. a, b) see solution set

7. \(w = 2 \text{ cis } \frac{\pi}{3}\); \(z_{1,2} = \sqrt{2} \text{ cis } \frac{\pi}{6}, \sqrt{2} \text{ cis } \frac{7\pi}{6} = \pm \left(\frac{\sqrt{6}}{2} + i \cdot \frac{\sqrt{2}}{2}\right)\)

8. 1, 3, 4, 7, 11, 18, 29, 47, 76, 123 (statement in Problem differs from conventional definition)

9. isosceles triangle with angles 30°, 30°, and 120°

10. 2330 people attending the theater

11. \(h = \frac{1000}{\sqrt{3} - 1}\) feet (≈1366 feet)

12. \(768 \sqrt{3}\) feet (≈1330 feet)