

Answers to Selected Questions

from *Elementary Linear Algebra: Applications Version, 9th ed.*

Chapter 10.1

#5. a) $2 + 3i$, b) $-1 - 2i$, c) $-2 + 9i$, #11. $76 - 88i$, #17. 0 ,

#19. a) $\begin{bmatrix} 1+6i & -3+7i \\ 3+8i & 3+12i \end{bmatrix}$, b) $\begin{bmatrix} 3-2i & 6+5i \\ 3-5i & 13+3i \end{bmatrix}$, c) $\begin{bmatrix} 3+3i & 2+5i \\ 9-5i & 13-2i \end{bmatrix}$, d) $\begin{bmatrix} 9+i & 12+2i \\ 18-2i & 13+i \end{bmatrix}$

#22. $-1 \pm i$, $\frac{1}{2} \pm \frac{\sqrt{3}}{2}i$

Chapter 10.2

#9. $-\frac{7}{625} - \frac{24}{625}i$ #11. $\frac{1-\sqrt{3}}{4} + \frac{1+\sqrt{3}}{4}i$ #15. a) $-1 - 2i$, b) $-3/25 - 4i/25$,

#19. a) $-y$, b) $-x$, c) y , d) x , #33. $(1+i)t, 2t$, #35. a) $\begin{bmatrix} i & 2 \\ -1 & i \end{bmatrix}$, b) $\begin{bmatrix} 0 & 1 \\ -i & 2i \end{bmatrix}$

Chapter 10.3

#3. a) $2\left(\cos\left(\frac{\pi}{2}\right) + i\sin\left(\frac{\pi}{2}\right)\right)$, b) $4\left(\cos(\pi) + i\sin(\pi)\right)$,
c) $5\sqrt{2}\left(\cos\left(\frac{\pi}{4}\right) + i\sin\left(\frac{\pi}{4}\right)\right)$, d) $12\left(\cos\left(\frac{2}{3}\pi\right) + i\sin\left(\frac{2}{3}\pi\right)\right)$
e) $3\sqrt{2}\left(\cos\left(-\frac{3}{4}\pi\right) + i\sin\left(-\frac{3}{4}\pi\right)\right)$ f) $4\left(\cos\left(-\frac{\pi}{6}\right) + i\sin\left(-\frac{\pi}{6}\right)\right)$

#5. $z_1 = e^{i\pi}$, $z_2 = 2e^{-i\pi/3}$, $z_3 = 2e^{i\pi/6}$, $\frac{z_1 z_2}{z_3} = 1$

#7. b) $\frac{\sqrt{6}}{2} + \frac{\sqrt{2}}{2}i$, $-\frac{\sqrt{6}}{2} - \frac{\sqrt{2}}{2}i$ #11. ± 2 , $\pm 2i$

c) -3 , $\frac{3}{2} + \frac{3\sqrt{3}}{2}i$, $\frac{3}{2} - \frac{3\sqrt{3}}{2}i$

#15. a) $\operatorname{Re}(z) = -3$, $\operatorname{Im}(z) = 0$

b) $\operatorname{Re}(z) = -3$, $\operatorname{Im}(z) = 0$

c) $\operatorname{Re}(z) = 0$, $\operatorname{Im}(z) = -\sqrt{2}$

d) $\operatorname{Re}(z) = -3$, $\operatorname{Im}(z) = 0$