

## Answer Key

1.  $(0,3)$
2.  $\left(4, \frac{5\pi}{6}\right), \left(-4, \frac{11\pi}{6}\right)$
3. D
4.  $r = 3\sec\theta$
5.  $r = \frac{1}{\sin\theta - 2\cos\theta}$
6.  $x^2 + y^2 = 4$
7.  $x^2 + (y-2)^2 = 4$
8.  $\left(\frac{3}{2}, \frac{\pi}{3}\right), \left(\frac{3}{2}, -\frac{\pi}{3}\right), (0,0)$
9. A and B
10.  $6\pi$
11. 56
12. 24
13.  $\mathbf{u} = 5\mathbf{i} + 2\mathbf{j}$ ,  $\mathbf{v} = 5\mathbf{i} + 2\mathbf{j}$ , which are equivalent.
14.  $\mathbf{v} = 5\mathbf{i} - 2\mathbf{j}$
15.  $\mathbf{v} = 1.95\mathbf{i} - 2.55\mathbf{j}$
16.  $\langle 18, 48 \rangle$                                        $\langle 0, -10 \rangle$                                        $\langle 15, 0 \rangle$
17.  $(0,6)$
18.  $\sqrt{34}$  or 5.8310
19.  $\langle 0.55, 0.83 \rangle$
20.  $\sqrt{82}$  or 9.06                                      1                                      1
21.  $\mathbf{v} = \langle -2.00, -3.46 \rangle$
22.  $\mathbf{v} = \langle -10.20, -11.66 \rangle$
23. 97.94 pounds at an angle of  $31.28^\circ$  with the positive  $x$ -axis.
24.  $(5,7,-3)$
25.  $\sqrt{56}$  or 7.4833 to four decimal places.
26.  $(-4, 5.5, 0)$
27.  $(x-4)^2 + (y-3)^2 + (z+4)^2 = 16$
28.  $(x-2)^2 + (y-5)^2 + (z-5)^2 = 18$
29.  $(x-3)^2 + (y-1)^2 + (z+4)^2 = 25$
30.  $\mathbf{u} = 3\mathbf{i} - 4\mathbf{j} + 3\mathbf{k}$
31.  $(0,2,0)$

32.  $\mathbf{z} = \langle 57, 17, 14 \rangle$

33.  $\sqrt{13}$  or 3.6056

34.  $\sqrt{59}$  or 7.6811

35.  $\langle -0.71, -0.42, 0.57 \rangle$

36. 45  $\langle 225, 225 \rangle$  135

37. 119.74 degrees

38. 15.26 degrees

39. Orthogonal

40. Orthogonal

41. Parallel, opposite direction

42.  $(0.6838, 0.4558, -0.5698)$

43.  $(-0.7428, 0.3714, 0.5571)$

44.  $31.0^\circ, 73.4^\circ, 64.6^\circ$

45.

$\langle -0.3784, -0.2703 \rangle$   $\langle -6.6216, 9.2703 \rangle$

46.

$\langle 2.9070, 5.8140, 1.1628 \rangle$   $\langle -3.9070, 1.1860, 3.8372 \rangle$