

Name: \_\_\_\_\_

## Unit Vector and Direction Angles

**Exercise 1:** Find the vector  $v$  with the given magnitude and the same direction as  $u$

1)  $\|v\| = 5, u = \langle 3, 3 \rangle$

2)  $\|v\| = 6, u = \langle -1, 2 \rangle$

3)  $\|v\| = 12, u = \langle 1, 4 \rangle$

4)  $\|v\| = 9, u = \langle 2, 5 \rangle$

5)  $\|v\| = 10, u = \langle -10, 0 \rangle$

6)  $\|v\| = 6, u = \langle -3, 3 \rangle$

**Exercise 2:** Given the initial point  $A$  and terminal point  $B$  of a vector, write a linear combination of the standard unit vectors  $i$  and  $j$

1)  $A(-3, 2); B(4, 2)$

2)  $A(0, -2); B(3, 5)$

3)  $A(0, 5); B(2, 0)$

4)  $A(-1, 0); B(0, 3)$

5)  $A(-1, -2); B(2, 4)$

6)  $A(4, 6); B(3, 7)$

7)  $A(10, 12); B(-6, -7)$

8)  $A(-3, -3); B(-4, -2)$

**Exercise 3:** Find the magnitude and the direction angle of the vector  $v$ .

1)  $v = -4i + 5j$

2)  $v = 9i + 3j$

3)  $v = 5i - 8j$

4)  $v = 3(\cos 30^\circ i + \sin 30^\circ j)$

5)  $v = -6(\cos 145^\circ i + \sin 145^\circ j)$

**Exercise 4:** Find the component form of  $v$  given its magnitude and the angle it makes with the positive  $x$ -axis. Sketch  $v$ .

1)  $\|v\| = 3, \theta = 0^\circ$

2)  $\|v\| = 1, \theta = 45^\circ$

3)  $\|v\| = 5\sqrt{2}, \theta = 150^\circ$

4)  $\|v\| = 2, \theta = 90^\circ$

5)  $\|v\| = \frac{5}{2}, \theta = 40^\circ$

6)  $\|v\| = \frac{3}{2}, \theta = 20^\circ$

7)  $\|v\| = 4\sqrt{3}, \theta = 80^\circ$

8)  $\|v\| = 7\sqrt{2}, \theta = 75^\circ$