

## Review 6.1-6.3

Answer the following

1) Let  $r = 7$ ,  $s = 2$ ,  $\mathbf{u} = \langle -1, 4 \rangle$ , and  $\mathbf{v} = \langle 5, -2 \rangle$ . Find  $|s\mathbf{u} + r\mathbf{v}|$ .

2) Find the unit vector in the direction of  $\langle 3, 5 \rangle$ .

3) Let  $A = (-2, 3)$  and  $B = (4, 5)$ .

A. Express the vector  $\overrightarrow{AB}$  as a linear combination of  $\mathbf{i} = \langle 1, 0 \rangle$  and  $\mathbf{j} = \langle 0, 1 \rangle$ .

4) Find  $\mathbf{u} \cdot \mathbf{v}$  given the angle between  $\mathbf{u}$  and  $\mathbf{v}$  is  $\theta = 55^\circ$  and  $|\mathbf{u}| = 3$  and  $|\mathbf{v}| = 2$ .

5) Let  $\mathbf{a} = \langle 6, 2 \rangle$  and  $\mathbf{b} = \langle -1, 3 \rangle$ . Find  $\text{proj}_{\mathbf{a}}\mathbf{b}$

6) Eliminate the parameters from the curve  $C$  defined by the parametric equations and identify the curve.

$$C = \begin{cases} x = t + 4 \\ y = 5 + t^2 \end{cases}$$

7) Determine the parameterization of the line with through  $A = (2, -3)$  and  $B = (1, 2)$ .

8) Find the angle between  $\mathbf{u} = \langle -2, 5 \rangle$  and  $\mathbf{v} = \langle 1, -3 \rangle$ .

9) An airplane is flying on a bearing of  $35^\circ$  at 550 mph. A wind is blowing with a bearing of  $45^\circ$  at 30 mph. Find the resultant speed and direction of the plane.

10) A golf ball is hit with an initial velocity of 150 ft/sec at an angle of  $29^\circ$  from the horizontal. Write a parametric equation that represents this situation, and tell me how long the ball is in the air.

11) How much work is done in lifting a 45-lb. child 8 feet off the ground?

12) How much work is done moving an object 8 feet straight up if 100 lbs of force is applied in a direction of  $\langle 2, 5 \rangle$ ?

13) A Ferris wheel has diameter of 60 feet, its center is 35 feet off the ground, and it takes 25 seconds to complete one revolution.

Give the equations for the Ferris wheel.

14.) When George throws a ball, he ALWAYS releases it at a height of 5 feet and at an angle of 75 degrees.

Give the equations for the path of the ball if George releases the ball with an initial velocity of 70 ft/sec.