Precalculus Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Vectors Quiz – Forms and Operations

Find the vector v that satisfies the following conditions. Write your answer in **component form.**

1. Initial point (-5,4); terminal point (2,-1) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. **** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Find the vector v that satisfies the following conditions. Write your answer in **linear combination** form.

3. Initial point (0,10); terminal point (7,3) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Use the vectors **u** = <-1,-3>, **v** = <-6, 8>, **w** = <4, -5> to perform the given operations.

5. **w** + 2**u** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. 3**v** – 3**w** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. 4 -  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Use the vector **u** = 6i – 5j and **v** = 10i + 3j to perform the given operations

8.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. 3**v** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. 4**u** – 5**v** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Find the **magnitude** and **direction** angle of each vector

11. **v** = -10i + 10j \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

12. **v** = <2, -5> \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Solve each of the following by resolving vectors. Show all work.

13. A Boeing 727 can travel at a speed of 495 miles per hour in still air. If one traveling 30° west of north encounters a wind blowing at 45 miles per hour 15° north of west, find the resulting **speed** and **direction** of the plane.

14. Two people are pushing a piano. One person pushes it with 175 N at an angle of 60o while the other pushes it with 250N at an angle of 30o. In what **direction** does the piano move and with how much **force**?

15. Ms. Parks travels the second floor of the high school building walking south through the hall for 20 meters. She then heads across the bridge on the second floor for 15 meters at 140°. She then travels 20 meters north and turns in to the math department where she walks 5 meters at 4°. What is the **displacement** of Ms. Parks’ trip from her point of origin and the **direction** she traveled?