Vector Concepts #1 Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Operations with Vectors Period\_\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_\_

If the figure to the right is parallelogram ABCD, complete the following:

1. AD = \_\_\_BC\_\_\_\_\_ D C

2. ½BD = \_\_\_\_\_BO or OD\_\_\_

O

3. 2AO = \_AC\_\_\_\_\_\_\_\_

4. AB + AD = \_AC\_\_\_\_\_\_\_\_\_ A B

5. AB + BC + CB = \_\_\_\_AB\_\_\_\_\_

6. DC + DA + OD = \_\_DO or OB\_\_\_\_\_\_\_

Vector Concepts #2 Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Operations with Vectors Period\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

In the figure to the right, ABCD is a parallelogram. If AB = x and AD = y, express the following in terms of x and y.

1. BC = \_\_y\_\_\_\_\_\_ B C

x O

y

2. CD = \_\_\_-x\_\_\_\_\_\_

3. AC = \_\_x + y\_\_\_\_\_\_\_

4. AO = \_ ½(x + y)\_\_\_\_\_ A D

5. BD = \_\_\_y - x\_\_\_\_\_\_\_

6. DO = \_\_ ½(x – y) \_\_\_\_\_\_\_\_

Vector Concepts #3 Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Operations with Vectors Period\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_

1. Sketch each of the following based on the sketches to the right.

A. a + b B. –b C. a – b

a

b

D. 2a E. b – a F. a + 2b

7. If the initial point of a vector is (5, 2) and its terminal point is (-3, 9), write it in component form. Then find its magnitude and standard position angle.



8. If the initial point of a vector is (-3, 8) and its terminal point is (5, 2), write it in component form. Then find its magnitude and standard position angle.



9. If u = <4, 7> and v = <-2, 5>, write each of the following:

A) 2u + v B) u – v C) scalars a and b if au + bv = <3, 4>

<6, 19> <6, 2> 4a – 2b = 3 and 7a + 5b = 4 → 

10. If |a| = 8 and θ = 330º, write the component form of a. 

11. If |b| = 6 and θ = 225º, write the component form of b. 

12. If u = <3, -4>, write a unit vector in the same direction as u. 

13. If v = <3, -4>, write a vector in the same direction as V that has a magnitude of 8. 

14. If a = <-12, 5>, write a vector in the same direction as a with magnitude 6. 

15. Find the angle between 5i + 2j and –i + 6j and check using another method.

 *\*Why use Cos-1(x) ???*

16. Find the angle between 3i - 8j and –4i - 6j and check using another method.

  *\*Is there a better way?*

17. Forces of 45 pounds and 60 pounds act on an object but the net resultant is 90 pounds of force. What angle separates the two forces?

Using the law of Cosines:

902 = 602 + 452 – 2(60)(45)cos(180-θ)

Solving this yields (180-θ) = 117.28˚,

so θ = 62.72˚

45 90

Θ 180-θ

60