PreCalculus Test Review   Name _____
Vectors – Extra Practice WS

To prepare for the test, be sure you review/practice ALL problems from the quiz AND worksheets!!!

Use the following vectors to find the requested information for # 1-13 on this worksheet. Round to the hundredth, if necessary. Write answers as the same vector format as it appears in the problem, unless otherwise stated.
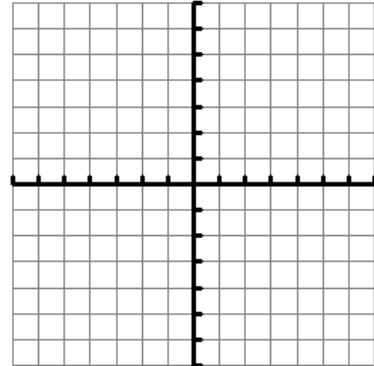
$\vec{a} = \langle 4, -7 \rangle$ 1. Graph and label each vector.

$\vec{b} = \langle -1, -3 \rangle$

$\vec{w} = -3\vec{i} + 2\vec{j}$

$\vec{u} = 4\vec{i} - \vec{j}$

2. The direction of vector $\vec{b}$ 3. The magnitude of vector $\vec{a}$

4. $\left\| \vec{w} \right\|$ 5. $\vec{a} \bullet \vec{b}$

6. $\dfrac{1}{2}\vec{b} - 4\vec{a}$ 7. $3\vec{w} + 6\vec{u}$

8. $\vec{w} \bullet \vec{u}$ 9. A unit vector in the same direction as $\vec{b}$
                                                              (give an EXACT answer here—no decimals)

10. A vector with magnitude 7 and the same direction as vector $\vec{w}$

11. The angle between vectors $\vec{w}$ and $\vec{u}$ when the vectors are placed tail to tail.

12. Write vector $\vec{b}$ in trig form.   13. Are vectors $\vec{a}$ and $\vec{b}$ orthogonal?
                                                              Why or why not? What are orthogonal vectors?

For the remaining problems, round to the hundredth, if necessary. Write answers as the same vector format as it appears in the problem, unless otherwise stated.

14. Given: P (-2, 4) and R (3, -2). Find the component form of $\overrightarrow{PR}$.

15. Write vector $\vec{d}$ in $\langle x, y \rangle$ format given that $\left\| \vec{d} \right\| = 3\sqrt{2}$ and the direction of the vector is 150^0.

16. Given: $\left\| \vec{w} \right\| = 4$, $\left\| \vec{u} \right\| = 7$ and the angle between the vectors measures 75^0.

   a. Find the magnitude of the resultant vector.

   b. Find the measure of the angle that is formed with the resultant and vector $\vec{w}$.

   c. Use the given information to find $\vec{u} \bullet \vec{w}$

17. Given: $\left\| \vec{w} \right\| = 5$, $\left\| \vec{v} \right\| = 3$, and $\vec{w} \bullet \vec{v} = 12$

   Find the measure of the angle between vectors if the vectors are placed tail to tail.

18. A scuba diver swims 100 ft/min on a bearing of S10°E. The water is moving with a current of 30 ft/min on a bearing of S65°E.
a. Draw your diagrams.

b. Find the resulting speed of the scuba diver.

c. Find the bearing of the scuba diver.

Answers:

2. 251.57^0	3. 8.06	4. 3.61	5. 17

6. $\langle -16.5, 26.5 \rangle$ 7. $15\vec{i}$ 8. -14   9. $\left\langle -\dfrac{\sqrt{10}}{10}, -\dfrac{3\sqrt{10}}{10} \right\rangle$

10. -5.82i + 3.88 j   11. 160.35^0 12. $\sqrt{10}\left(\cos 251.57^0, \sin 251.57^0 \right)$

13.   No, dot product does not = 0. Orthogonal = perpendicular vectors.

14. $\langle 5, -6 \rangle$ or 5i – 6j   15. $\left\langle -\dfrac{3\sqrt{6}}{2}, \dfrac{3\sqrt{2}}{2} \right\rangle$ 16.   a. 8.92   b. 49.27°   c. 7.25

17.   36.87°   18.   b. 119.75 ft/min   c. E68.16°S