

Name: _____

Vectors and Dot Products

1) Find the dot product of u and v .

1. $u = \langle 6, 7 \rangle$
 $v = \langle -3, 9 \rangle$

2. $u = \langle -7, 12 \rangle$
 $v = \langle -4, -14 \rangle$

3. $u = 3i + 7j$
 $v = 11i - 5j$

4. $u = -7i + 2j$
 $v = 16i - 12j$

2) Use the vector $u = \langle -3, 4 \rangle$ and $v = \langle 2, 1 \rangle$ to find the indicated quantity. State whether the result is a vector or a scalar.

1. $2u \cdot u$

2. $\|v\|^2$

3. $u(u \cdot v)$

4. $3(u \cdot v)$

3) Find the angles between the following pairs of vectors

1) $a = 2i - 3j$ and $b = 5i + j$

2) $a = 2i - 7j$ and $b = 6i - 21j$

3) $a = 4i - 6j$ and $b = -3i + 3j$

4) $a = 3i - 5j$ and $b = i + j$

5) $a = 2i - j$ and $b = -8i + 4j$

4) Determine whether u and v are orthogonal, parallel, or neither.

1. $u = \langle -3, 8 \rangle$
 $v = \langle 8, 3 \rangle$

2. $u = \left\langle \frac{1}{4}, -\frac{1}{2} \right\rangle$
 $v = \langle -2, 4 \rangle$

3. $U = -i$
 $V = i + 2j$

4. $U = -2i + j$
 $V = 3i + 6j$