

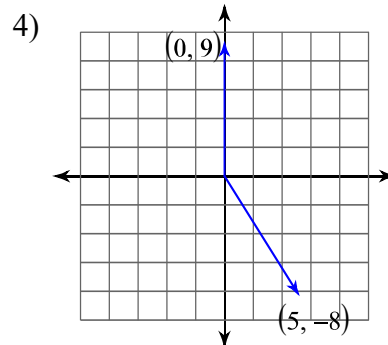
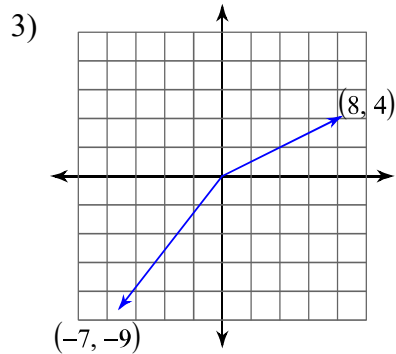
## Two-Dimensional Vector Dot Products

Date \_\_\_\_\_ Period \_\_\_\_\_

**Find the dot product of the given vectors.**

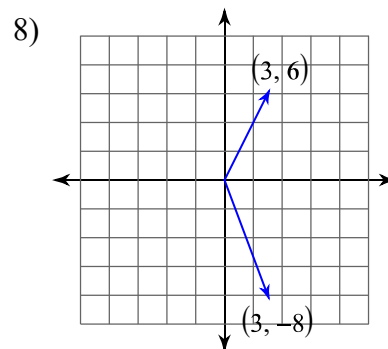
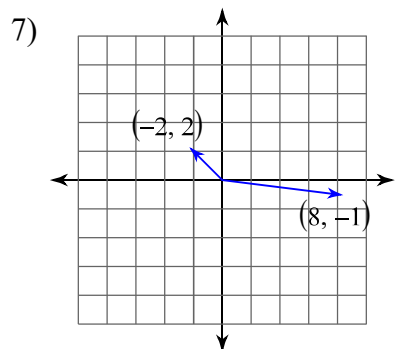
1)  $\vec{u} = \langle 3, 9 \rangle$   
 $\vec{v} = \langle 6, 5 \rangle$

2)  $\vec{u} = -\vec{i} + 5\vec{j}$   
 $\vec{v} = -6\vec{i} - 2\vec{j}$

**State if the two vectors are parallel, orthogonal, or neither.**

5)  $\vec{u} = \langle 4, -9 \rangle$   
 $\vec{v} = \langle -9, 4 \rangle$

6)  $\vec{u} = -5\vec{i} - 2\vec{j}$   
 $\vec{v} = -10\vec{i} + 25\vec{j}$

**Find the measure of the angle between the two vectors.**

$$9) \begin{aligned} \vec{u} &= \langle -8, -2 \rangle \\ \vec{v} &= \langle -3, 3 \rangle \end{aligned}$$

$$10) \begin{aligned} \vec{u} &= -8\vec{j} \\ \vec{v} &= -9\vec{i} - 2\vec{j} \end{aligned}$$

**Find the projection of u onto v.**

$$11) \begin{aligned} \vec{u} &= \langle 8, 2 \rangle \\ \vec{v} &= \langle -7, -3 \rangle \end{aligned}$$

$$12) \begin{aligned} \vec{u} &= 5\vec{i} - 5\vec{j} \\ \vec{v} &= 7\vec{i} - 5\vec{j} \end{aligned}$$

**Find the projection of u onto v. Then write u as the sum of two orthogonal vectors.**

$$13) \begin{aligned} \vec{u} &= \langle -2, -3 \rangle \\ \vec{v} &= \langle -7, 9 \rangle \end{aligned}$$