Angle Between Two Vectors WS

Name _____Pfister_____

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

1) $u = \langle -5, 5 \rangle$
   $v = \langle -7, -4 \rangle$

   $\theta = \cos^{-1}\left(\dfrac{15}{\sqrt{50} \cdot \sqrt{65}}\right)$

   $\boxed{74.74°}$  $= \cos^{-1}\left(\dfrac{15}{\sqrt{3250}}\right)$

2) $u = \langle 3, -6 \rangle$
   $v = \langle 2, -3 \rangle$

   $\theta = \cos^{-1}\left(\dfrac{24}{\sqrt{45} \cdot \sqrt{13}}\right)$

   $= \cos^{-1}\left(\dfrac{24}{\sqrt{585}}\right)$

   $\boxed{7.13°}$

3) $u = \langle -3, 1 \rangle$
   $v = \langle -8, 0 \rangle$

   $\theta = \cos^{-1}\left(\dfrac{24}{\sqrt{10} \cdot \sqrt{64}}\right)$

   $\boxed{18.43°}$  $= \cos^{-1}\left(\dfrac{24}{\sqrt{640}}\right)$

4) $u = \langle -5, 7 \rangle$
   $v = \langle 4, 8 \rangle$

   $\theta = \cos^{-1}\left(\dfrac{36}{\sqrt{74} \cdot \sqrt{80}}\right)$

   $\boxed{62.10°}$  $= \cos^{-1}\left(\dfrac{36}{\sqrt{5920}}\right)$

5) $u = \langle -6, 9 \rangle$
   $v = \langle -3, -2 \rangle$

   $\theta = \cos^{-1}\left(\dfrac{0}{\sqrt{\ }}\right)$

   $\boxed{90°}$   doesn't matter!

6) $u = \langle 9, 5 \rangle$
   $v = \langle 3, -5 \rangle$

   $\theta = \cos^{-1}\left(\dfrac{2}{\sqrt{106} \cdot \sqrt{34}}\right)$

   $\boxed{88.09°}$  $= \cos^{-1}\left(\dfrac{2}{\sqrt{3604}}\right)$

7) $u = \langle -9, 6 \rangle$
   $v = \langle -9, 8 \rangle$

   $\theta = \cos^{-1}\left(\dfrac{129}{\sqrt{117} \cdot \sqrt{145}}\right)$

   $\boxed{7.94°}$  $= \cos^{-1}\left(\dfrac{129}{\sqrt{16965}}\right)$

8) $u = \langle 4, -4 \rangle$
   $v = \langle 3, 3 \rangle$

   $\theta = \cos^{-1}\left(\dfrac{0}{\sqrt{\ }}\right)$

   $\boxed{90°}$

9) $u = \langle 3, 8 \rangle$
   $v = \langle -5, 4 \rangle$

   $\theta = \cos^{-1}\left(\dfrac{17}{\sqrt{73} \cdot \sqrt{41}}\right)$

   $\boxed{71.90°}$  $= \cos^{-1}\left(\dfrac{17}{\sqrt{2993}}\right)$

10) $u = \langle 9, -2 \rangle$
    $v = \langle 0, -3 \rangle$

    $\theta = \cos^{-1}\left(\dfrac{6}{\sqrt{85} \cdot \sqrt{9}}\right)$

    $\boxed{77.47°}$  $= \cos^{-1}\left(\dfrac{6}{\sqrt{765}}\right)$

11) $u = \langle 4, 1 \rangle$
    $v = \langle 0, 5 \rangle$

    $\theta = \cos^{-1}\left(\dfrac{5}{\sqrt{17} \cdot \sqrt{25}}\right)$

    $\boxed{75.96°}$  $= \cos^{-1}\left(\dfrac{5}{\sqrt{425}}\right)$

12) $u = \langle 9, -8 \rangle$
    $v = \langle 5, 5 \rangle$

    $\theta = \cos^{-1}\left(\dfrac{5}{\sqrt{145} \cdot \sqrt{50}}\right)$

    $\boxed{86.63°}$  $= \cos^{-1}\left(\dfrac{5}{\sqrt{7250}}\right)$