Pre-Cal AB Review Sheet TEST 3-1 Name KEY
Sections 10.5-10.6A

1) Find the **magnitude** of $\overrightarrow{PQ}$

a) $P=(-7,0)\quad Q=(-4,-5)$ $\sqrt{34}$

b) $P=(1,5)\quad Q=(7,11)$ $6\sqrt{2}$

2) Find the **equivalent vector** to the vector $\overrightarrow{PQ}$

a) $P=(-4,-8)\quad Q=(-10,2)$ $\langle -6,10\rangle$

b) $P=\left(\frac{4}{5},-2\right)\quad Q=\left(\frac{17}{5},\frac{-12}{5}\right)$ $\left\langle \frac{13}{5},-\frac{2}{5}\right\rangle$

3) Find $2u-3v$. Leave answers in the vector form.

a) $u=\langle 1,5\rangle\quad v=\langle 7,11\rangle$

$\langle -19,-23\rangle$

b) $u=2\langle -2,5\rangle\quad v=\frac{1}{4}\langle -8,12\rangle$

$\langle -2,11\rangle$

c) $u=i-2j\quad v=-4i+j$

$14i-7j$

4) Find the **magnitude** of $u+v$

$u=\langle 3,1\rangle\quad v=\langle -6,-2\rangle$

$u+v=\langle -3,-1\rangle$

$\|u+v\|=\sqrt{10}$

5) Find the **magnitude** of $u-v$

$u=\langle -8,4\rangle\quad v=\langle -7,3\rangle$

$u-v=\langle -1,1\rangle$

$\|u-v\|=\sqrt{2}$

6) Find the **component form** ($xi+yj$) of the vector whose magnitude and direction angle are given.

a) $\|v\|=20\quad \theta=125^\circ$

$\langle -11.4715, 16.3830\rangle$

b) $\|v\|=8\quad \theta=60^\circ$ (no decimals accepted)

$\langle 4, 4\sqrt{3}\rangle$

7) Find the **magnitude** $\|v\|$ and **direction angle** θ

a) $v=\langle 4,5\rangle$

$\|v\|=\sqrt{41}$

$\theta=51.3402^\circ$

b) $v=4i-8j$

$\|v\|=4\sqrt{5}$

$\theta=296.5658^\circ$

c) $v=-15i-10j$

$\|v\|=5\sqrt{13}$

$\theta=213.69^\circ$

8) Find the **unit vector** that has the same direction $\boxed{\frac{u}{\|u\|}}$ (answer in same form)

a) $\langle 2,7 \rangle$

$\left\langle \frac{2\sqrt{53}}{53}, \frac{7\sqrt{53}}{53} \right\rangle$

b) $-4i-8j$

$\frac{-\sqrt{5}}{5}i - \frac{2\sqrt{5}}{5}j$

9) Find the **dot product** $u \cdot v$

a) $u=\langle 3,-5 \rangle \quad v=\langle -4,3 \rangle$

-27

b) $u=5i+2j \quad v=-6i-3j$

-36

10) Find the **angle** between the vectors. Leave answer in degree mode. $\boxed{\theta = Cos^{-1}\left(\frac{u \cdot v}{\|u\|\|v\|}\right)}$

a) $u=2i-3j \quad v=-i$

$\theta = 123.69°$

b) $u=\sqrt{3}i+\sqrt{3}j \quad v=i-j$

$\theta = 90°$

c) $u=\langle -2,6 \rangle \quad v=\langle 4,-1 \rangle$

$\theta = 122.4712°$

11) Determine which pair of vectors are **parallel, orthogonal, or neither.** Show all work to earn full credit.

a) $u=\langle 15,12 \rangle \quad v=\langle 5,4 \rangle$

parallel

b) $u=\langle 4,2 \rangle \quad v=\langle 3,6 \rangle$

neither

$K=\frac{3}{4} \quad K=3$

c) $u=4i+8j \quad v=-6i+3j$

Orthogonal

12) Find k so that the vectors are orthogonal for

$u=-3i+j \quad v=2ki-4j$

$(-3)(2K)+(1)(-4)=0$

$-6K-4=0$

$\frac{-6K}{-6}=\frac{4}{-6}$

$\boxed{K=-\frac{2}{3}}$