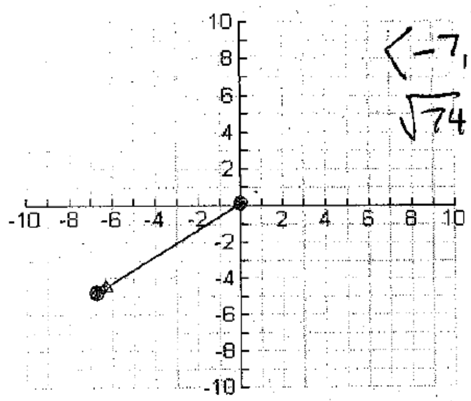
GSE PreCalculus
Test 7 Review – Vectors

Name ______________________________
Date ______________________ Day _____

1. Show that vector u and vector v are equal
   Vector u: initial: (2, -5), terminal: (-1, 4)
   Vector v: initial: (7, 1), terminal: (4, 10)

   4+5 / -1-2 $\langle -3, 9\rangle$ 4-7 / 10-1 $\langle -3, 9\rangle$

2. Find the component form and the magnitude of the vetor v.



$\langle -7, -5\rangle$
$\sqrt{74} = 8.6$

Find a.) $u - v$ b.) $-3u + 2v$ c.) $-v + 5u$

3. $u = \langle 2, 3\rangle$ $v = \langle -3, 0\rangle$

a. $\langle 5, 3\rangle$
b. $\langle -12, -9\rangle$
c. $\langle 13, 15\rangle$

4. $u = \langle 2, -1\rangle$ $v = \langle -4, 7\rangle$

a. $\langle 6, -8\rangle$
b. $\langle -14, 17\rangle$
c. $\langle 14, -12\rangle$

Find the magnitude and direction of each vector.

5. $u = \langle 3, -5\rangle$

mag = 5.8
direct = -59.04°

6. $v = \langle -2, 3\rangle$

mag = 3.6
direct = ~~-56.3°~~ 123.7°

Find the component form given magnitude and direction

7. $\|v\| = 2$ $\theta = -53^\circ$ $\langle 1.2, -1.6\rangle$

8. $\|v\| = 3$ $\theta = 60^\circ$ $\langle 1.5, 2.6\rangle$

9. $\|v\| = 4$ $\theta = 110^\circ$ $\langle -1.4, 3.8\rangle$

Cumulative Review Questions from Tests 1-6:

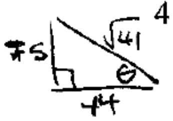
1. Identify the following conics: a. $\dfrac{(x-3)^2}{10}-\dfrac{y^2}{4}=1$ hyperbola   b. $(x+1)^2+y^2=16$ Circle ~~ellipse~~

2. Multiply the following matrices: $\begin{bmatrix} 2 & 9 \\ -7 & 3 \end{bmatrix}\cdot\begin{bmatrix} 6 & -4 \\ 0 & 3 \end{bmatrix}$ $\begin{bmatrix} 12 & 19 \\ -42 & 37 \end{bmatrix}$

3. Solve the linear system: $\begin{matrix} 7x+4y=-17 \\ 8x+5y=-19 \end{matrix}$ $\begin{bmatrix} -3 \\ 1 \end{bmatrix}$

4. Find a positive co-terminal angle to: a. $\theta=-\dfrac{2\pi}{5}$ $\dfrac{8\pi}{5}$ b. $\theta=\dfrac{\pi}{7}$ $\dfrac{15\pi}{7}$

5. If $\tan\theta=-\dfrac{5}{4}$ and θ is in quadrant 4, what is the exact value of cos θ? $\cos\theta = +\dfrac{4}{\sqrt{41}} = \dfrac{+4\sqrt{41}}{41}$



6. Find the reference angle: a. $\theta=210°$ $30°$ b. $\theta=315°$ $45°$

7. Find the exact value of the following function: $\sin\left(-\dfrac{4\pi}{3}\right)$ $\dfrac{\sqrt{3}}{2}$

8. Evaluate $\cos^{-1}\left(\dfrac{\sqrt{3}}{2}\right)$ in degrees and radians $30°$

9. Find the amplitude, period, horizontal shift, and vertical shift for $f(x)=3\sin\left(x+\dfrac{\pi}{4}\right)+7$.

Amp = 3   HS = $-\pi/4$ period = 2π VS = 7

10. Evaluate $\arcsin\left(-\dfrac{1}{2}\right)$ $-30° = 330°$

11. Simplify: $\dfrac{\sec^2\theta-1}{\sin^2\theta}$ $\dfrac{\tan^2 x}{\sin^2 x} = \dfrac{\frac{\sin^2 x}{\cos^2 x}}{\frac{\sin^2 x}{1}} = \dfrac{\sin^2 x}{\cos^2 x}\cdot\dfrac{1}{\sin^2 x} = \dfrac{1}{\cos^2 x} = \sec^2 x$

12. Solve for x: $2\sin x-\sqrt{3}=0$ $60°$

13. Evaluate: $\sin 105°$ (use $105° = 45° + 60°$) $\sin(\alpha\pm\beta)=\sin\alpha\cos\beta\pm\cos\alpha\sin\beta$ $\dfrac{\sqrt{2}+\sqrt{6}}{4}$

$\sin 45 \cos 60 + \cos 45 \sin 60$ $\left(\frac{\sqrt{2}}{2}\right)\left(\frac{1}{2}\right)+\left(\frac{\sqrt{2}}{2}\right)\left(\frac{\sqrt{3}}{2}\right)$

14. Given a triangle with $A=20°, B=50°$, and $a=5$, find c.

$\dfrac{\sin 20}{5} = \dfrac{\sin 110}{c}$ 13.7

15. What is the area of a triangle with sides of 5, 7, and 9. Use $Area=\sqrt{s(s-a)(s-b)(s-c)}$

17.4