

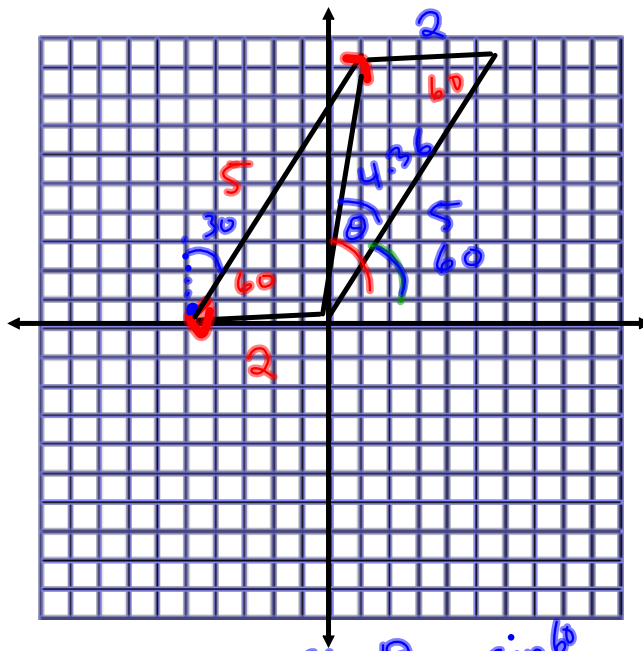
Q3/

$\vec{u} = 5 \text{ unit, } 30^\circ \text{ E of N}$
 $\text{N } 30^\circ \text{ E}$

$\vec{w} = 2 \text{ units, West}$

$\vec{t} = 4 \text{ units, } 60^\circ \text{ W of S}$
 $\text{S } 60^\circ \text{ W}$

$$\vec{w} + \vec{u} = \vec{r}$$



$$r = \sqrt{(2^2 + 5^2 - (2)(2)(5)\cos 60)}$$

$$r = 4.36$$

$$\frac{\sin \theta}{2} = \frac{\sin 60}{4.36}$$

$$\sin \theta = \frac{2 \sin 60}{4.36}$$

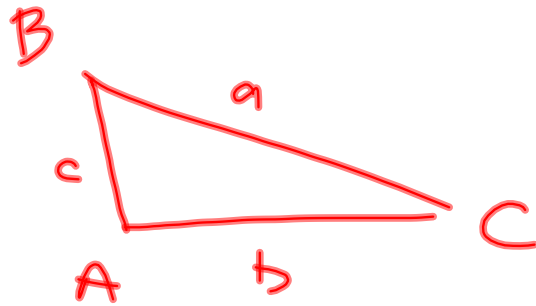
$$\theta = \sin^{-1} \left[\frac{(2 \sin 60)}{4.36} \right]$$

$$\theta = 23.41^\circ$$

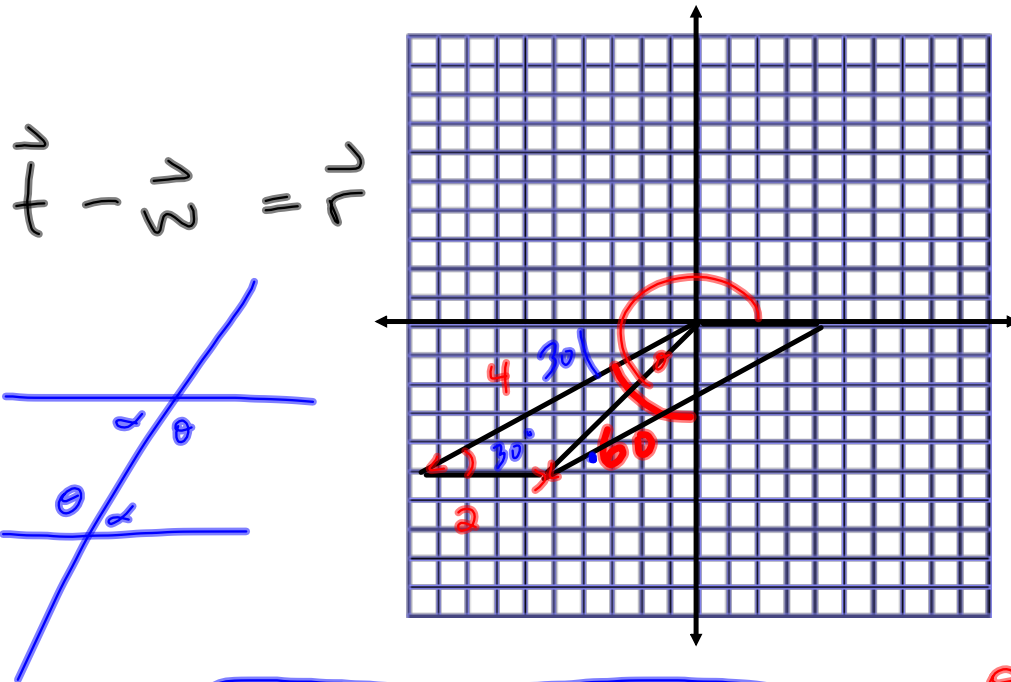
$$\theta_{\vec{r}} = 23.41^\circ + 60^\circ$$

$$\theta_{\vec{r}} = 83.41^\circ$$

$$\vec{r} = 4.36, 83.41^\circ$$



$$a^2 = b^2 + c^2 - 2bc \cos A$$



$$r = \sqrt{(2^2 + 4^2 - 2(2)(4)\cos 30)} \quad \frac{\sin \theta}{2} = \frac{\sin 30}{2.479}$$

$$r = 2.479, 233.79^\circ$$

$$\sin \theta = \frac{2 \sin 30}{2.479}$$

$$\theta_r = 23.79 + 30 + 180 \quad \theta = \sin^{-1} \left[\frac{2 \sin 30}{2.479} \right]$$

$$\theta_r = 233.79$$

$$\theta = 23.79$$

Vector Basis is the addition of any two vectors that aren't collinear or opposite.

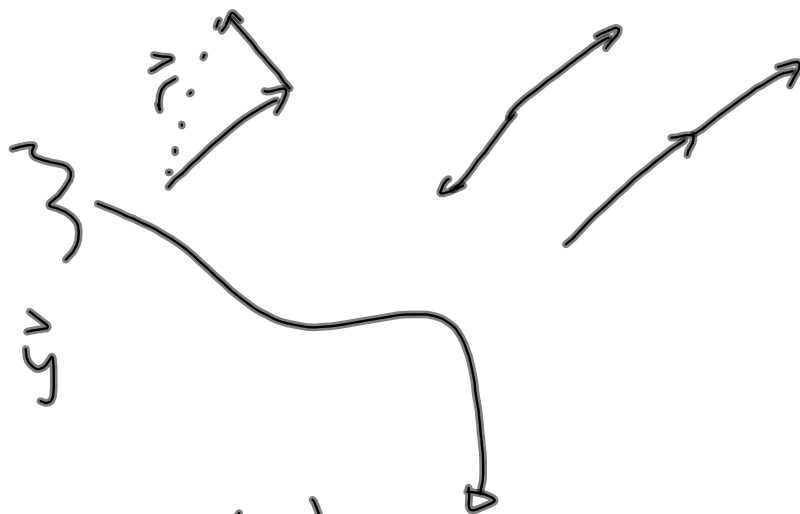
a) \vec{d}, \vec{w}

b) $\vec{d} + \vec{w}$
 $\vec{a} + \vec{e}$

c) $\vec{u} + \vec{y}$

d) \vec{f}

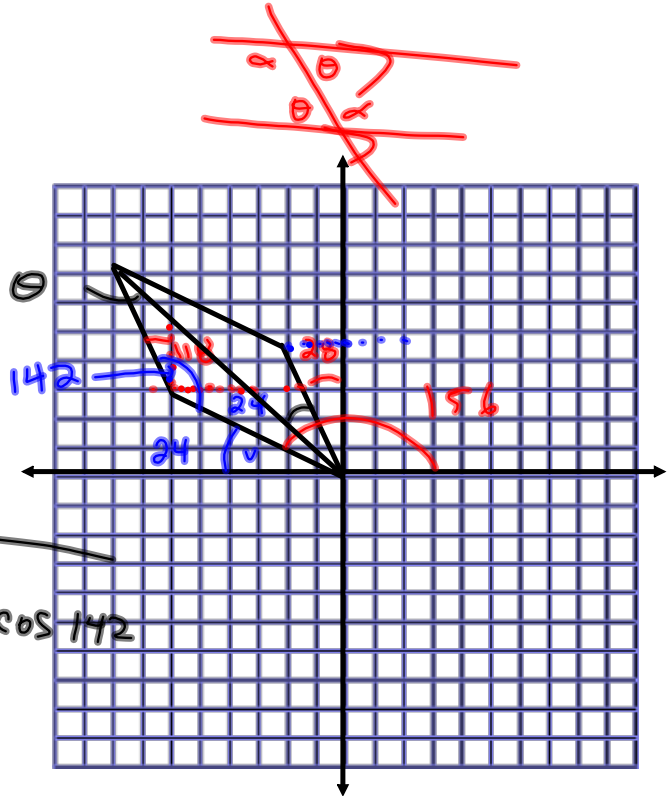
e) all of them except



$$\vec{u} = 3, N 28 W$$

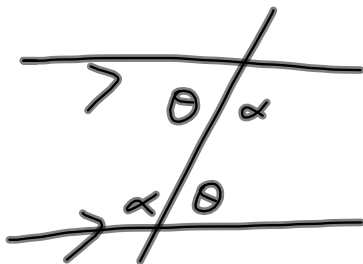
$$\vec{v} = 6, 156^\circ$$

$$\vec{r} = \vec{u} + \vec{v}$$



$$r = \sqrt{3^2 + 6^2 - 2(3)(6)\cos 142}$$

$$r = 8.566$$



$$\frac{\sin 142}{8.566} = \frac{\sin \theta}{6}$$

$$\frac{6 \sin 142}{8.566} = \sin \theta$$

$$\theta = \sin^{-1} \left[\frac{(6 \sin 142)}{8.566} \right]$$

$$\theta = 25.55$$

Q7:

$$\vec{r} = (2.5, -1)$$

$$\vec{v} = (0, -5)$$

θ between \vec{u} and \vec{w}

$$\vec{u} = 3\vec{v} - \frac{1}{5}\vec{r}$$

$$3\vec{v} = (3 \cdot 0, 3 \cdot (-5))$$

$$3\vec{v} = (0, -15)$$

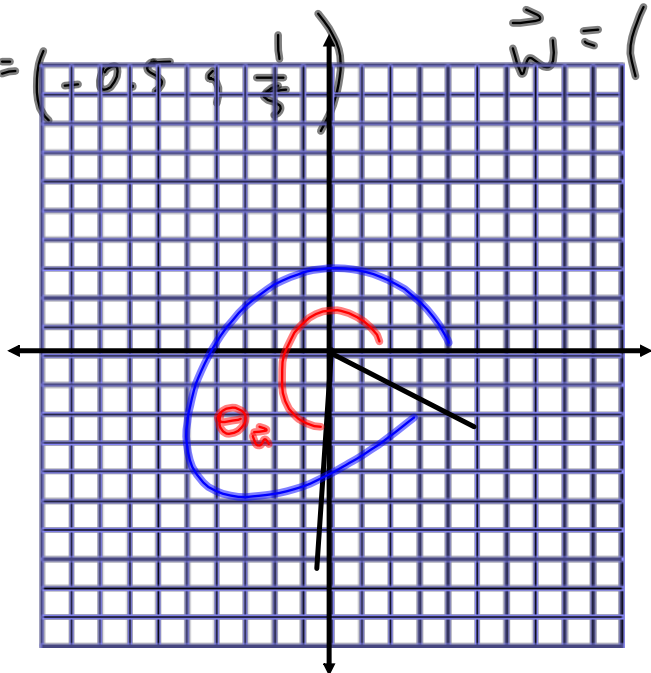
$$-\frac{1}{5}\vec{r} = \left(-\frac{1}{5} \cdot 2.5, -\frac{1}{5} \cdot (-1)\right)$$

$$-\frac{1}{5}\vec{r} = \left(-0.5, \frac{1}{5}\right)$$

$$\vec{u} = (0 + (-0.5), -15 + \frac{1}{5})$$

$$\vec{u} = (-0.5, -14.8)$$

$$\vec{w} = (10, -4.5)$$



$$\theta_{\vec{u}} = 88$$

$$\theta_{\vec{u}'} = 88 + 180$$

$$\theta_{\vec{u}'} = 268$$

$$\theta_{\vec{u}} = \tan^{-1}\left(\frac{y}{x}\right)$$

$$\theta_{\vec{w}} = \tan^{-1}\left(\frac{y}{x}\right)$$

$$\theta_{\vec{w}'} - \theta_{\vec{u}'}'$$

$$336 - 268 = 68^\circ$$

$$\theta_{\vec{w}} = -24$$

$$\theta_{\vec{w}'} = 336$$

Q 13

$$\tan \theta = \frac{\text{opposite}}{\text{adj}}$$

$$\tan \theta = \frac{3.5}{2.5}$$

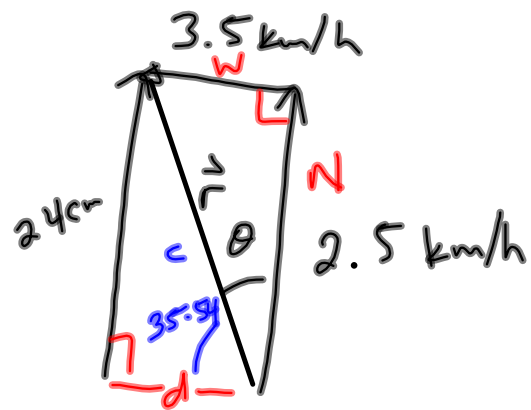
$$\theta = \tan^{-1}\left(\frac{3.5}{2.5}\right)$$

$$\theta = 54.46$$

$$\tan 35.54 = \frac{24}{d}$$

$$d = \frac{24}{\tan 35.54}$$

$$d = 33.597 \text{ cm}$$



$$\sin \theta = \frac{op}{h}$$