a)

```
x=[100;100;100]
xn=[0.58;0.58;0.58]
A=[0 0 .42;.6 0 0;0 .75 .95];
for n=1:10
    xn = A * xn
end
```

b)

```
A=[0 0 .42;.6 0 0;0 .75 .95];
[E,D]=eig(A)
plotv(E(:,3),'-')
```

c)

vector would stretch further and further out

$$\vec{v} = \begin{bmatrix} 9 \\ 12 \\ 15 \end{bmatrix} \qquad |\vec{v}| = \sqrt{9^2 + 12^2 + 15^2} \quad \sqrt{81 + 144 + 225} = 21.$$

$$\vec{u} = \begin{bmatrix} -2 \\ 0 \\ 4 \end{bmatrix} \qquad |\vec{u}| = \sqrt{4 + 16} = \boxed{4.47}$$

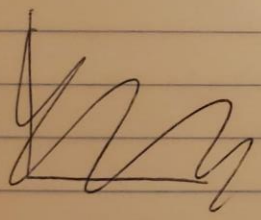
$$\hat{v} = \frac{\vec{v}}{|\vec{v}|} = \frac{9 \quad 12 \quad 15}{21.12} = \boxed{[0.42 \quad 0.57 \quad 0.71]}$$

$$\hat{u} = \frac{\vec{u}}{|\vec{u}|} = \frac{-2 \quad 0 \quad 4}{4.47} = \boxed{[-0.45 \quad 0 \quad 0.89]}$$

$$0.87^2 \quad 0.57^2 \quad -0.18^2$$

$$\sqrt{0.7569 + 0.3249 + 0.0324}$$

$$\sqrt{1.1142} = \boxed{1.056}$$



$$\vec{u} = \begin{bmatrix} -1 \\ 4 \\ -3 \end{bmatrix} \quad \vec{v} = \begin{bmatrix} 5 \\ 2 \\ 1 \end{bmatrix} \quad \vec{w} = \begin{bmatrix} 3 \\ -4 \\ 7 \end{bmatrix}$$

$\vec{u} \cdot \vec{v} = -5 + 8 - 3 = 0$ ✓

$\vec{u} \cdot \vec{w} = -3 - 16 - 21 \neq 0$ ✗

$\vec{v} \cdot \vec{w} = 15 - 8 + 7 \neq 0$ ✗