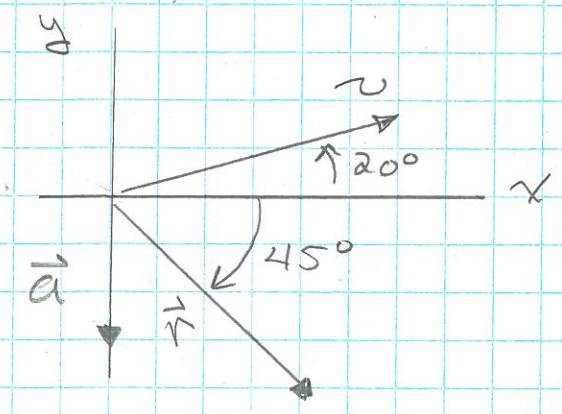
a.) $\vec{r}$ = (100 m, 45° below +x axis)



$r = |\vec{r}| = 100\ m$

$r_x = r\cos 45° = 70.7\ m$

$r_y = -r\sin 45° = -70.7\ m$

$\vec{r} = 70.7\hat{i} - 70.7\hat{j}\ m$

b.) $\vec{v}$ = (300 m/s, 20° above x-axis)

$v = |\vec{v}| = 300\ m/s$

$v_x = v\cos 20° = 281.9\ m/s$

$v_y = v\sin 20° = 102.6\ m/s$

$\vec{v} = 281.9\hat{i} + 102.6\hat{j}\ m/s$

c.) $\vec{a}$ = (5.0 m/s^2, -y direction)

$a_x = 0$

$a_y = -a = -5.\ m/s^2$

$\vec{a} = -5\hat{j}\ m/s^2$