Quiz - Le 23   Name: _____

1. The equation relating the acceleration of two points on the same rigid body undergoing plane motion is (circle all the correct answers):

$$a_B = a_A + \alpha \times r_{B/A} + \omega \times (\omega \times r_{B/A})$$

$$\vec{a}_B = \vec{a}_A + \vec{\alpha} \times \vec{r}_{B/A} + \omega^2 \vec{r}_{B/A}$$

$$\vec{a}_B = \vec{a}_A + \vec{\alpha} \times \vec{r}_{B/A} - \omega^2 \vec{r}_{B/A}$$

$$a_B = a_A + \alpha r + \omega^2 r$$

$$\vec{a}_B = \vec{a}_A + \vec{\alpha} \times \vec{r}_{B/A} + \vec{\omega} \times (\vec{\omega} \times \vec{r}_{B/A})$$

$$\vec{a}_B = \vec{a}_A + \vec{\alpha} \times \vec{r}_{B/A} + \vec{\omega} \times \vec{v}_{B/A}$$

$$\vec{a}_B = \vec{a}_A + \vec{\alpha} \times \vec{r}_{A/B} + \vec{\omega} \times (\vec{\omega} \times \vec{r}_{A/B})$$

2. If $\vec{\alpha} = \alpha \hat{k}$ and $\vec{r} = 4\hat{i} + 3\hat{j}$ determine $\vec{\alpha} \times \vec{r}$

3. After substituting into the acceleration equation relating two points on the same rigid body and taking the appropriate cross products the following result is obtained:

$$a_c \hat{j} = 60\hat{i} - 0.2\alpha\hat{j} + 0.2\alpha\hat{i} - 85\hat{i} - 85\hat{j}$$

Solve for a_c and α.