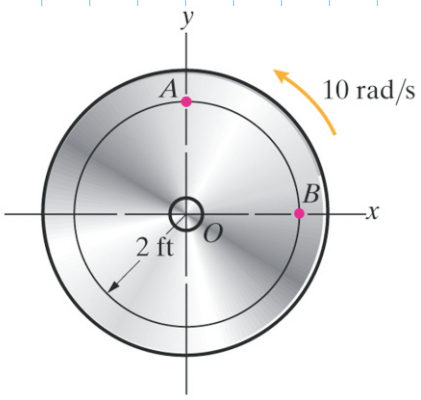
Name Date

Week: _____ **Problem:** _____

Given:

Relative to the earth-fixed coordinate system, the disk rotates about the fixed point O at 10 rad/s. What is the velocity of point A relative to point B at the instant shown?

What is the acceleration of point A relative to point B at the instant shown?



Required:

Solution:

Solution:

$\mathbf{v}_A = -(10 \text{ rad/s})(2 \text{ ft})\mathbf{i} = -(20 \text{ ft/s})\mathbf{i}$

$\mathbf{v}_B = (10 \text{ rad/s})(2 \text{ ft})\mathbf{j} = (20 \text{ ft/s})\mathbf{j}$

$\boxed{\mathbf{v}_{A/B} = \mathbf{v}_A - \mathbf{v}_B = (-20\mathbf{i} - 20\mathbf{j}) \text{ ft/s}}$

$\mathbf{a}_A = -(10 \text{ rad/s})^2(2 \text{ ft})\mathbf{j} = -(200 \text{ ft/s}^2)\mathbf{j}$

$\mathbf{a}_B = -(10 \text{ rad/s})^2(2 \text{ ft})\mathbf{i} = -(200 \text{ ft/s}^2)\mathbf{i}$

$\boxed{\mathbf{a}_{A/B} = \mathbf{a}_A - \mathbf{a}_B = (200\mathbf{i} - 200\mathbf{j}) \text{ ft/s}^2}$