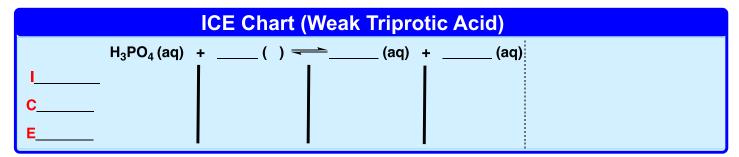
CONCEPT: TRIPROTIC ACIDS AND BASES CALCULATIONS

pH of Weak Triprotic Species

- Utilize **only** _____ to calculate the pH of the acidic form of a weak triprotic acid.
 - □ Utilize **only** _____ to calculate the pH of the basic form of a weak triprotic acid.

EXAMPLE: Determine the pH of a 0.225 M phosphoric acid, H_3PO_4 , solution. $K_{a1} = 7.5 \times 10^{-3}$, $K_{a2} = 6.2 \times 10^{-8}$ and $K_{a3} = 4.2 \times 10^{-13}$.

- STEP 1: Setup an ICE Chart for the weak triprotic acid that has it reacting with ______.
 - □ Use the Bronsted-Lowry definition to predict the products formed.



- **STEP 2:** Using the **INITIAL ROW**, place the amount given for the weak acid.
 - $\hfill\Box$ Place a ____ for any substance not given an initial amount.
- STEP 3: We _____ reactants to _____ products.
 - □ Using the **CHANGE ROW**, place a _____ for the reactants and a _____ for the products.
- STEP 4: Using the EQUILIBRIUM ROW, setup the equilibrium constant expression with _____ and solve for ____.
 - □ Check if a shortcut can be utilized to avoid the _____ formula.

CONCEPT: TRIPROTIC ACIDS AND BASES
PRACTICE: Determine the pH of 0.250 M sodium phosphate, Na ₃ PO ₄ . Phosphoric acid, H ₃ PO ₄ , contains K _{a1} = 7.5 x 10 ⁻³ ,
$K_{a2} = 6.2 \times 10^{-8}$ and $K_{a3} = 4.2 \times 10^{-13}$.
PRACTICE: Determine the pOH of 0.450 M citric acid, $H_3C_6H_5O_7$. It possesses $K_{a1} = 7.4 \times 10^{-4}$, $K_{a2} = 1.7 \times 10^{-5}$ and $K_{a3} = 4.0 \times 10^{-7}$.