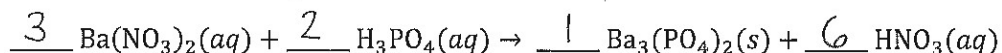


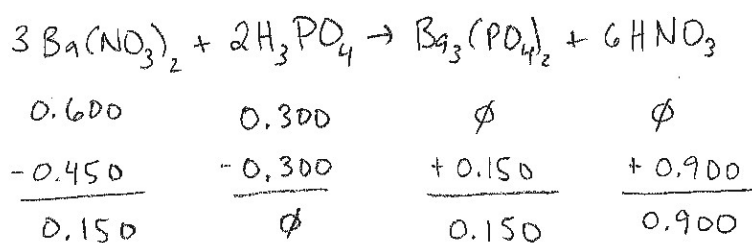
## Unit 2: AP Free Response Practice #2 [2003 Form B #2, modified, 5 points]

2. In a reaction vessel, 0.600 mol of  $\text{Ba}(\text{NO}_3)_2(\text{s})$  and 0.300 mol of  $\text{H}_3\text{PO}_4(\text{aq})$  are combined with deionized water to a final volume of 2.00 L. The reaction represented below occurs.



- a. Balance the equation above by writing the correct coefficients in the blanks provided. [1 point]

- b. Calculate the mass of  $\text{Ba}_3(\text{PO}_4)_2(\text{s})$  formed. [2 points]



$$\frac{0.600 \text{ mol Ba}(\text{NO}_3)_2}{3} = 0.2$$

limiting!  
smaller!

$$\frac{0.300 \text{ mol H}_3\text{PO}_4}{2} = 0.15$$

$$0.150 \text{ mol Ba}_3(\text{PO}_4)_2 \times \frac{601.93 \text{ g}}{1 \text{ mol}} = \boxed{90.3 \text{ g Ba}_3(\text{PO}_4)_2}$$

- c. Calculate the moles of nitric acid formed. [1 point]



$$\boxed{0.900 \text{ mol HNO}_3}$$

(see BCA table)

- d. How many moles of excess reactant are left over once the reaction stops? [1 point]

$$\boxed{0.150 \text{ mol Ba}(\text{NO}_3)_2}$$

left over

(see BCA table)