Review Exercise 8 - Mole-to-Mole Stoichiometry

Balance the following equations and use the mole ratio from the balanced equation to complete the table which follows each equation:

1. _____ $H_2O(l)$ -------> _____ $H_{2(g)}$ + _____ $O_{2(g)}$

_____ $H_2O_{(l)}$ ------> _____ $H_{2(g)}$ + _____ $O_{2(g)}$		
5.00	.	.
.	.	0.600
.	3.00	.

2. _____ $Na_{(s)}$ + _____ $HOH_{(l)}$ -------> _____ $H_{2(g)}$ + _____ $NaOH_{(aq)}$

_____ $Na_{(s)}$ + _____ $HOH_{(l)}$ ----------> _____ $H_{2(g)}$ + _____ $NaOH_{(aq)}$			
8.0 mol	.	.	.
.	0.20 mol	.	.
.	.	4.80 mol	.
.	.	.	16.0 mol

3. ____ $Al_2(SO_4)_{3(aq)}$ + ____ $NH_4OH_{(aq)}$ -------> ____ $Al(OH)_{3(s)}$ + ____ $(NH_4)_2SO_{4(aq)}$

____ $Al_2(SO_4)_{3(aq)}$ + ____ $NH_4OH_{(aq)}$ ------ > ____ $Al(OH)_{3(s)}$ + ____$(NH_4)_2SO_{4(aq)}$			
3.00 mol	.	.	.
.	2.00 mol	.	.
.	.	1.00 mol	.
.	.	.	1.00 mol

4. _____ $C_4H_{8(g)}$ + _____ $O_{2(g)}$ --------> _____ $CO_{2(g)}$ + _____ $H_2O_{(g)}$

_____ $C_4H_{8(g)}$	+ _____ $O_{2(g)}$	--------> _____ $CO_{2(g)}$	+ _____ $H_2O_{(g)}$
.	.	.	0.212
.	.	0.120	.
.	0.500	.	.
0.320	.	.	.

5. _____ $P_{4(s)}$ + _____ $I_{2(s)}$ --------> _____ $PI_{3(s)}$

_____ $P_{4(s)}$	+ _____ $I_{2(s)}$	--------> _____ $PI_{3(s)}$
.	.	2.82
.	0.396	.
2.50	.	.

6. Use the following equation to answer the questions below.

$N_{2(g)}$ + $3H_{2(g)}$ -------> $2NH_{3(g)}$

a) How many moles of hydrogen will react with 5.0 moles of nitrogen?
b) How many moles of hydrogen and nitrogen will react to produce 20 moles of ammonia?
c) If 4.0 moles of hydrogen are used, how many moles of nitrogen are needed?
d) If 3.6 moles of nitrogen are used, how many moles of ammonia are produced?
e) If 0.673 moles of ammonia are produced, how many moles of hydrogen are needed?
f) If 2.3 moles of ammonia are produced, how many moles of nitrogen are needed?