In-class Stoichiometry worksheet - Review for upcoming test

Naming:

Write the chemical formula for: $Ca(OH)_2$ Calcium Hydroxide; $Mg_3(PO_4)_2$ Magnesium Phosphate; NH_4NO_3 Ammonium Nitrate

Name the following compounds: P_2O_5 diphosphorus pentoxide; $Al(OH)_3$ aluminum hydroxide; FeO Iron (II) oxide

1. Given the following equation: $2\ KClO_3 \rightarrow 2\ KCl + 3\ O_2$
What mass of O_2 can be produced by letting 12.00 moles of $KClO_3$ react?

$\frac{2\ mol\ KClO_3}{12.00\ mol\ KClO_3} = \frac{3\ mol\ O_2}{x}$ $x = 18.00\ mol\ O_2$

$\frac{1\ mol\ O_2}{18.00\ mol\ O_2} = \frac{32.00\ g}{x}$ $x = 576.0\ g\ O_2$

2. Given the following equation: $2\ K + Cl_2 \rightarrow 2\ KCl$
What mass of KCl is produced from 2.50 g of K and excess Cl_2?

$\frac{78.20\ g\ K}{2.50\ g\ K} = \frac{149.10\ g\ KCl}{x}$ $x = 4.77\ g\ of\ KCl$

3. Given the following equation: $2\ NaClO_3 \rightarrow 2\ NaCl + 3\ O_2$
~~a) What mass of O_2 are produced from 12.00 moles of $NaClO_3$?~~
a) What mass of NaCl are produced when 80.0 grams of O_2 are produced?

$\frac{2\ mol\ NaClO_3}{12.00\ mol\ NaClO_3} = \frac{3\ mol\ O_2}{x}$ $x = 18.00\ mol\ O_2$

$\frac{116.88\ g\ NaCl}{x} = \frac{96.00\ g\ O_2}{80.0\ g\ O_2}$ $x = 97.4\ g\ NaCl$

4. Given the following equation: $Cu + 2\ AgNO_3 \rightarrow Cu(NO_3)_2 + 2\ Ag$
a) How many moles of Cu are needed to react with 3.50 moles of $AgNO_3$?
b) How many moles of Cu reacted if 89.5 g of Ag were produced?

a) $\frac{1\ mol\ Cu}{x} = \frac{2\ mol\ AgNO_3}{3.50\ mol\ AgNO_3}$ $x = 1.75\ mol\ Cu$

b) $\frac{1\ mol\ Ag}{x} = \frac{107.87\ g\ Ag}{89.5\ g\ Ag}$ $x = 0.829702\ mol\ Ag$

$\frac{1\ mol\ Cu}{x} = \frac{2\ mol\ Ag}{0.829702\ mol\ Ag}$ $x = 0.415\ mol\ Cu$

5. The average human requires 120.0 grams of glucose ($C_6H_{12}O_6$) per day. What mass of CO_2 are is produced for this amount of glucose? The respiration reaction is: $C_6H_{12}O_6 + 6\ O_2 \rightarrow 6\ CO_2 + 6\ H_2O$

$\frac{180.18\ g\ C_6H_{12}O_6}{120.0\ g\ C_6H_{12}O_6} = \frac{264.06\ g\ CO_2}{x}$ $x = 175.864$

$x = 175.9\ g\ CO_2$