Name _____ Period _____

College Prep Chemistry of the Earth

Assignment 7M – *Mass of an Ideal Gas* 20 Points

Complete the following problems based on the ideal gas law

Ideal Gas Law Forms	$P = \frac{nRT}{V}$	$V = \frac{nRT}{P}$	$n = \frac{PV}{RT}$	$T = \frac{PV}{nR}$
$PV = nRT$				

Ideal Gas Constant [*R*]	$R = 0.0821 \frac{L \cdot atm}{mol \cdot K}$

MM_{CO_2} : 44.01 g = 1 mol

$n = \frac{PV}{RT}$

P = 0.94atm, V = 59.38L,
n = ____mol CO_2, T = 428.45K

n =	$\frac{0.94\,atm \cdot 59.38\,L}{(0.0821 \frac{L \cdot atm}{mol \cdot K} \cdot 428.45\,K)}$
n =	1.59 mol CO_2

Molar Mass CO_2 = 44.01g/mol
n = ____mol CO_2, mass CO_2 = ____g CO_2

m = CO_2	1.59 mol	44.01 g
		1 mol
m = CO_2	69.98 g CO_2	

P = 1.85atm, V = 36.37L,
n = ____mol H_2O, T = 327.49K

n =	
n =	mol H_2O

Molar Mass CO_2 = 18.02g/mol
n = ____mol H_2O, mass H_2O = ____g H_2O

m = H_2O		
m = H_2O	g H_2O	

P = 4.85atm, V = 18.48L,
n = ____mol SO_2, T = 526.27K

n =	
n =	mol SO_2

Molar Mass SO_2 = 64.07g/mol
n = ____mol SO_2, mass SO_2 = ____g SO_2

m = SO_2		
m = SO_2	g SO_2	

Start

27.03g = 1 mol

mass HCN = 47.48g, n = ____mol HCN
Molar Mass HCN = 27.03g/mol

n =	47.48 g	1 mol
		27.03 g
n =	1.76 mol HCN	

P = 2.35atm, V = ____L,
n = ____mol HCN, T = 384.58K

V =	$1.76\,mol \cdot 0.0821 \frac{L \cdot atm}{mol \cdot K} \cdot 384.58\,K$
	2.35 atm
V =	23.65 L

$V = \frac{nRT}{P}$

mass HCl = 67.32g, n = ____mol HCl
Molar Mass HCl = 36.36g/mol

n =	
n =	mol HCl

P = 0.82atm, V = 42.84L,
n = ____mol HCl, T = ____K

T =	
T =	

mass SO_3 = 47.48g, n = ____mol SO_3
Molar Mass SO_3 = 80.07g/mol

n =	
n =	mol SO_3

P = ____atm, V = 41.32L,
n = ____mol SO_3, T = 391.48K

P =	
P =	

mass Cl_2 = 183.42g, n = ____mol Cl_2
Molar Mass Cl_2 = 70.90g/mol

n =	
n =	mol Cl_2

P = 0.95atm, V = ____L,
n = ____mol Cl_2, T = 459.49K

V =	
V =	