Gas Laws Packet #2
Ideal Gas Law Worksheet PV = nRT

Use the ideal gas law, "PV-nRT", and the universal gas constant ***R = 0.0821 L*atm / K*mol***
to solve the following problems:
If pressure is needed in kPa then convert by multiplying by *101.3kPa / 1atm* to get
R =8.31 L*kPa / (K*mole)

1) If I have 4 moles of a gas at a pressure of 5.6 atm and a volume of 12 liters, what is the temperature?

1) $PV = nRT$ 2) $\frac{PV}{nR} = T$ 3) $\frac{5.6\ atm \times 12\ L}{4\ moles \times 0.0821} = 203.6\ K$

2) If I have an unknown quantity of gas at a pressure of 1.2 atm, a volume of 31 liters, and a temperature of 87 ^{0}C, how many moles of gas do I have?

1) $PV = nRT$ 2) $n = \frac{PV}{RT}$ 3) $\frac{1.2\ atm \times 31\ L}{0.0821 \times 360\ K} = 1.3\ moles$

3) If I contain 3 moles of gas in a container with a volume of 60 liters and at a temperature of 400 K, what is the pressure inside the container?

1) $PV = nRT$ 2) $P = \frac{nRT}{V}$ 3) $\frac{3\ moles \times 0.0821 \times 400\ K}{60\ L} = 1.6\ atm$

4) If I have 7.7 moles of gas at a pressure of 0.09 atm and at a temperature of 56 ^{0}C, what is the volume of the container that the gas is in?

1) $PV = nRT$ 2) $V = \frac{nRT}{P}$ 3) $\frac{7.7\ moles \times 0.0821 \times 329\ K}{0.09\ atm} = 2310.9\ L$

5) If I have 17 moles of gas at a temperature of 67 ^{0}C, and a volume of 88.89 liters, what is the pressure of the gas?

1) $PV = nRT$ 2) $P = \frac{nRT}{V}$ 3) $\frac{17\ moles \times 0.0821 \times 340\ K}{88.89\ L} = 5.3\ atm$

6) If I have an unknown quantity of gas at a pressure of 0.5 atm, a volume of 25 liters, and a temperature of 300 K, how many moles of gas do I have?

1) $PV = nRT$ 2) $n = \frac{PV}{RT}$ 3) $\frac{0.5\ atm \times 25\ L}{0.0821 \times 300\ K} = .51\ moles$

7) If I have 21 moles of gas held at a pressure of 78 atm and a temperature of 900 K, what is the volume of the gas?

1) $PV = nRT$ 2) $V = \frac{nRT}{P}$ 3) $\frac{21 \text{ moles} \times 0.0821 \times 900K}{78 \text{ atm}} = 19.9 \text{ L}$

8) If I have 1.9 moles of gas held at a pressure of 5 atm and in a container with a volume of 50 liters, what is the temperature of the gas?

1) $PV = nRT$ 2) $\frac{PV}{nR} = T$ 3) $\frac{5 \text{ atm} \times 50 \text{ L}}{0.0821 \times 1.9} = 1562.5 \text{ K}$

9) If I have 2.4 moles of gas held at a temperature of 97 ^{0}C and in a container with a volume of 45 liters, what is the pressure of the gas?

1) $PV = nRT$ 2) $P = \frac{nRT}{V}$ 3) $\frac{2.4 \text{ moles} \times 0.0821 \times 370K}{45 \text{ L}} = 1.6 \text{ atm}$

10) If I have an unknown quantity of gas held at a temperature of 1195 K in a container with a volume of 25 liters and a pressure of 560 atm, how many moles of gas do I have?

1) $PV = nRT$ 2) $n = \frac{PV}{RT}$ 3) ~~#15~~ $\frac{560 \text{ atm} \times 25 \text{ L}}{0.0821 \times 1195} = 142.7 \text{ moles}$

11) If I have 0.275 moles of gas at a temperature of 75 K and a pressure of 1.75 atmospheres, what is the volume of the gas?

1) $PV = nRT$ 2) $V = \frac{nRT}{P}$ 3) $\frac{.275 \times 0.0821 \times 75K}{1.75 \text{ atm}} = .99 \text{ L}$

12) If I have 72 liters of gas held at a pressure of 3.4 atm and a temperature of 225 K, how many moles of gas do I have?

1) $PV = nRT$ 2) $\frac{PV}{RT} = n$ 3) $\frac{3.4 \text{ atm} \times 72 \text{ L}}{.0821 \times 225K} = 13.0 \text{ moles}$