

## Quiz #1

Name: \_\_\_\_\_

SHOW ALL WORK TO RECEIVE FULL CREDIT. NO CALCULATORS.

1. Write a general formula to describe each variation (3 points each).

(a)  $v$  varies directly with  $t$ ;  $v = 16$  when  $t = 2$

(b)  $y$  varies inversely with  $x$ ;  $y = 4$  when  $x = 4$

(c)  $A$  varies directly with the square of  $r$ ;  $A = 4\pi$  when  $r = 2$

(d)  $V$  varies jointly with  $h$  and the square of  $r$  with constant of proportionality  $\frac{\pi}{3}$

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2. (8 points) The volume  $V$  of an ideal gas varies directly with the temperature  $T$  and inversely with the pressure  $P$ . Write an equation relating  $V$ ,  $T$ , and  $P$  using  $k$  as the constant of proportionality. If a cylinder contains oxygen at a temperature of 300K and a pressure of 15 atmospheres in a volume of 100 liters, what is the constant of proportionality  $k$ ? If a piston is lowered into the cylinder, decreasing the volume occupied by the gas to 80 liters and raising the temperature to 320K, what is the gas pressure?
3. (1 point) EXTRA CREDIT. Does the relation  $\{(1, 4), (2, 3), (3, 1), (1, 6)\}$  represent a function? Why or why not?