12.5 Variation and Solving formulas and Variation   Name:_____

1. **The Doppler Effect.** The formula $F = \dfrac{sg}{s+v}$ is used to determine the frequency F of a sound that is moving at a velocity v toward a listener who hears the sound as frequency g. Here is the speed of sound in a particular medium. Solve the formula for s.

2. **Work Formula.** The formula $\dfrac{1}{a} + \dfrac{1}{b} = \dfrac{1}{t}$ involves the total time t for some work to be done by two workers whose individual times are a and b. solve the formula for t.

- Examples:

3. $I = \dfrac{nE}{E+nr}$, for n

4. $I = \dfrac{2V}{V+2r}$, for V

- **Direct Variation**: Find the variation constant and an equation of variation in which y varies directly as x and the following are true.

5. $y = 54$ when $x = 12$

- Examples:
   6. The number N of aluminum cans used each year varies directly as the number of people using the cans. If 250 people use 60,000 cans in one year, how many cans are used each year in Dallas, which has a population of 1,189,000?

- **Inverse Variation**: Find the variation constant and an equation of variation in which y varies inversely as x and the following are true.

7. $y = 14$ when $x = 7$

- Examples:
  8. Work rate. The time *T* required to do a job varies inversely as the number of people *P* working. It takes 5 hr. for 7 bricklayers to build a park wall. How long will it take 10 bricklayers to complete the job?

- **Joint Variation**: Find the variation constant when and an equation of variation when y varies directly as the square of x and inversely as z when the following are true.
  9. $y = 100$, $x = 5$, $z = 4$

- Examples:
  10. The number N of aluminum cans used each year varies directly as the number of people using the cans. If 250 people use 60,000 cans in one year, how many cans are used each year in Dallas, which has a population of 1,189,000?

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