

Unit 32 Solving Formula Problems

1. Solving formulas

- A. Solving formulas is necessary when the unknown quantity is not by itself, on one side of the equation.
- B. Using $D = rt$ as an example
1. Suppose D and t are known and r is unknown.
 2. r must be isolated from t
 3. Isolate r using the rule of opposites (review section 2 on page 76).
 - a. When variables are being multiplied, to isolate one, divide by the other.
 - b. In $D = rt$, r is isolated by dividing both sides of the formula by t .
 - c. Dividing **both sides** of the formula by t is necessary to keep the formula in balance.
- C. Example: A family driving across the country traveled 420 miles in 7 hours. How fast were they traveling?

Unknown: rate	Formula: $D = rt$
Given: distance = 420 miles time = 7 hours	$420 \text{ miles} = (r)(7 \text{ hours})$
	$\frac{420 \text{ miles}}{7 \text{ hours}} = \frac{(r)(\cancel{7 \text{ hours}})}{\cancel{7 \text{ hours}}}$
	$60 \frac{\text{miles}}{\text{hours}} = r$
Note: When writing the answer, the unknown is placed to the left.	$r = 60 \text{ mph}$

Note: Be sure to label your answer.

2. Solving multi-step formulas

- A. Many formulas require a number of steps to complete.
- B. Water boils at 212 degrees Fahrenheit. Find its boiling point in Celsius.

Unknown: boiling point in Celsius	Given: $F = 212$ degrees
Formula:	
$C = \frac{5}{9}(F - 32)$	→ Substitute 212 for F
$= \frac{5}{9}(212 - 32)$	→ Do the math in the parentheses first; subtract 32 from 212
$= \frac{5}{9}(180)$	→ Divide by 9
$= 5(20)$	→ Multiply by 5
$C = 100$ degrees	