SOLVING FORMULAS

1. **To evaluate a formula** substitute the given value(s) for the variable(s) and simplify using the order of operations.

Example: The formula for the area of a trapezoid is given by

\[ A = \frac{1}{2}(B + b)h, \text{ where } B \text{ is the lower base, } b \text{ is the upper base, and } h \text{ is the height} \]

Find the area when \( B = 15 \text{ ft}, b = 9 \text{ ft}, \text{ and } h = 6 \text{ ft}.\)

Solution: Substitute the given values for \( B, b \) and \( h \), then simplify as shown.

\[
A = \frac{1}{2}(15 + 9) \cdot 6 = \frac{1}{2}(24)(6) = 12(6) = 72 \text{ ft}^2
\]

2. **To solve a formula** for a specified variable

1) Clear fractions and decimals if necessary.
2) Combine like terms if necessary.
3) Add or subtract to get the term with the variable on one side of the equation.
4) Multiply or divide to solve for the specified variable.

Example: Solve \( A = \frac{1}{2}(B + b)h \) for \( b \)

Solution:

\[
A = \frac{1}{2}(B + b)h
\]

\[
2 \cdot A = 2 \cdot \frac{1}{2}(B + b)h \quad \text{← Clear fractions - multiply each term by the LCD 2.}
\]

\[
2A = (B + b)h \quad \text{← Remove parentheses - distribute h.}
\]

\[
2A = Bh + bh
\]

\[
2A - Bh = Bh + bh - Bh \quad \text{← Isolate the term bh - subtract Bh from both sides.}
\]

\[
2A - Bh = bh
\]

\[
\frac{2A - Bh}{h} = \frac{bh}{h} \quad \text{← Solve for } b \text{ - divide both sides by } h.
\]

\[
\frac{2A - Bh}{h} = b
\]