

## Conditional Equations

A conditional equation is true for certain values of the variable and false for others.

When we think of solving an equation and getting an answer, we are thinking about a conditional equation.

$$
\begin{array}{r}
x+2=7 \\
x=5
\end{array}
$$

This equation is only true on the condition that $x=5$.

## Contradictions

A contradiction is never true.
It is false for every value of the variable.

$$
\begin{aligned}
x+3 & =x+5 \\
-x \quad & =-x \\
3 & =5
\end{aligned}
$$

$$
3 \text { can never }=5
$$

This is a contradiction; it has no solution.

## Identities

An identity is always true.
It is true for every value of the variable.

$$
\begin{aligned}
& x+3=x+3 \\
&-x \quad=-x \\
& 3=3 \\
& 3 \text { always equals } 3
\end{aligned}
$$

This is an identity; it is true for all real numbers.

# Identities, Contradictions and Conditional Equations 

$3=3 \quad$ Identity<br>$3=5$<br>$x=5$<br>Contradiction<br>Conditional equation

All real numbers

No solution
True on the condition that $\mathrm{x}=5$.

