Absolute Value Equations

Objective: To solve absolute value equations.

Absolute Value Review

- The symbol for _______ value is | |.
- Evaluate:
  a) |3| =
  b) |-5| =
  c) -|17| =
  d) -| -6 | =

Absolute Value General Forms

|ax+b| = k, |ax+b| > k, or |ax+b| < k

2 for 1: To solve absolute value equations and inequalities, you must remember there are _____ possibilities.

To solve |ax+b| = k, set up & solve __________ or __________.

e) |x - 4| = 7

To solve |ax+b| = k, set up & solve __________ or __________.

f) |2x + 5| = 13

Steps for Absolute Value Equations

- __________ the absolute value expression.
- Set up two equations, with one _______ “k” and one _______ “k”.
- Solve.
- Check.
Assorted Examples

\[ g) \ |x + 5| - 2 = 12 \]

\[ h) \ |7x + 12| = |x - 8| \]

Special Cases

\[ i) \ |8n + 4| = -4 \]

\[ j) \ |4 + 7x| = 0 \]

Steps for Absolute Value Inequalities

- Set up \( |ax+b| > k \) and solve

For greater than:

\[ \text{set up & solve } |ax+b| > k \]

\[ \text{or } |ax+b| < k \]

For less than:

\[ |ax+b| < k \]

\[ \text{set up & solve a compound inequality: } \]

\[ \text{solve.} \]

\[ \text{check.} \]

To solve \( |ax+b| > k \), set up & solve

\[ \text{or } \]

\[ k) \ |x + 2| > 3 \]
Solve.

1) \(|3x - 4| \geq 11\)

To solve \(|ax+b|<k\), set up & solve ________________.

k) \(|x + 2| < 3\)

SUMMARY

- Remember, absolute value problems are **2-for-1**...there are actually two problems to work out.
- For greater than, set up an “or” statement.
- For less than, set up an “and” statement or compound inequality.