2.4 Solving Equations Algebraically – Part 2

Other Equations – Algebraic vs Graphically

Example 1 (Radical Equations)

Solve: \( \sqrt{x - 10} = 4 \)

\[
\begin{align*}
\sqrt{x - 10} &= 4 \\
(x - 10) &= 16 \\
x &= 26
\end{align*}
\]

Check
2.4 Solving Equations Algebraically – Part 2

Other Equations – Algebraic vs Graphically

Example 2 (Radical Equations)

Solve: \( \sqrt{2x + 7} - x = 2 \)

\[
\left( \sqrt{2x + 7} \right)^2 = (x + 2)^2
\]

\[
2x + 7 = x^2 + 4x + 4
\]

\[
0 = x^2 + 2x - 3
\]

must \( 0 = (x + 3)(x - 1) \)

Check \( x = -3 \) \( \Box \)

\( \circ \)

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2.4 Solving Equations Algebraically – Part 2

Other Equations – Algebraic vs Graphically

Example 3 (Radical Equations)

Solve: \( \sqrt{x} + \sqrt{x - 20} = 10 \)

\[
\left( \sqrt{x - 20} \right)^2 = \left( 10 - \sqrt{x} \right)^2
\]

\[
x - 20 = 100 - 20\sqrt{x} + x
\]

\[
-120 = -20\sqrt{x}
\]

\[
\frac{-120}{-20} = \frac{-20\sqrt{x}}{-20}
\]

\[
6 = \sqrt{x}
\]

\[
36 = x
\]
2.4 Solving Equations Algebraically – Part 2

Other Equations – Algebraic vs Graphically

Example 4 ( Radical Equations ) TRY IT!

Solve: $\sqrt{2x + 6} + \sqrt{x + 4} = 4$
2.4 Solving Equations Algebraically – Part 2

Other Equations – Algebraic vs Graphically

Example 5 (Absolute Value Equations)

Solve: $|3x - 1| = 7$
Example 6 (An Application) An open box with a square base is to be constructed from 84 square inches of material. What should the dimensions be if the height of the box is to be 2 inches.
2.4 Solving Equations Algebraically – Part 2

Example 7 (An Application) A rancher has 100 meters of fencing to enclose two adjacent rectangular corrals. Find the dimensions of the corrals so that the enclosed area will be 350 square meters.
2.4 Solving Equations Algebraically – Part 2

The position equation: \( s = -16t^2 + v_0 \cdot t + s_0 \)

Example 8 (An Application #128, p. 202) You throw a baseball straight up into the air at a velocity of 45 ft per second. You release the baseball at a height of 5.5 ft and catch it at a height of 6 feet.

(a) Find the height of the baseball after 0.5 seconds

(b) How long is the ball in the air?