Name _____ Date _____ Class _____

LESSON 8-8

Practice A

Solving Radical Equations and Inequalities

Rewrite each equation to isolate the radical. The first one is done for you.

1. $\sqrt{x} - 6 = 0$

$+6 \quad +6$

$\sqrt{x} = 6$

2. $8 + \sqrt{3x} - x = 0$

3. $\sqrt{2x + 1} - 17 = 3x$

Identify to what power each equation must be raised in order to solve. Then solve. The first one is done for you.

4. $\sqrt[2]{x} = 4$

2; $\left(\sqrt[2]{x}^2\right) = 4^2 = 16$

5. $\sqrt[4]{3x} = 12$

6. $\sqrt[3]{x + 1} = 4$

Solve each equation ro inequality. Then identify any extraneous solutions. The first one is done for you.

7. $2\sqrt{x + 2} = 4$

$\frac{2\sqrt{x + 2}}{2} = \frac{4}{2}$

$\sqrt{x + 2} = 2$

$\left(\sqrt{x + 2}\right)^2 = 2^2$

$x + 2 = 4$

$x = 2$, no extraneous roots

8. $\sqrt{x + 3} = x - 3$

Solve each equation or inequality.

9. $\sqrt{x + 2} = 5$

10. $(x + 1)^{\frac{1}{3}} = 3$

11. $\sqrt{2x} - 6 < 0$

12. $\sqrt{3x + 1} \geq 8$

Solve.

13. Ainsley and Ben each solve the inequality $\sqrt{x + 3} + 5 \leq 10$. Ainsley's solution is $x \leq 22$. Ben's solution is $-3 \leq x \leq 22$. Why are their solutions different? Which is correct?

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Rewrite each equation to isolate the radical. The first one is done for you.

1. $\sqrt{x} - 6 = 0$

$+6 \quad +6$

$\sqrt{x} = 6$

2. $8 + \sqrt{3x} - x = 0$

$\sqrt{3x} = x - 8$

3. $\sqrt{2x + 1} - 17 = 3x$

$\sqrt{2x + 1} = 3x + 17$

Identify to what power each equation must be raised in order to solve. Then solve. The first one is done for you.

4. $\sqrt[2]{x} = 4$

$2; \left(\sqrt[2]{x}^2\right) = 4^2 = 16$

5. $\sqrt[4]{3x} = 12$

$4; x = \frac{69}{2}$

6. $\sqrt[3]{x + 1} = 4$

$3; x = 63$

Solve each equation ro inequality. Then identify any extraneous solutions. The first one is done for you.

7. $2\sqrt{x + 2} = 4$

$\frac{2\sqrt{x + 2}}{2} = \frac{4}{2}$

$\sqrt{x + 2} = 2$

$\left(\sqrt{x + 2}\right)^2 = 2^2$

$x + 2 = 4$

$x = 2$, no extraneous roots

8. $\sqrt{x + 3} = x - 3$

$x = 1, x = 6; x = 1$ is an extraneous solution.

Solve each equation or inequality.

9. $\sqrt{x + 2} = 5$

$x = 23$

10. $(x + 1)^{\frac{1}{3}} = 3$

$x = 26$

11. $\sqrt{2x} - 6 < 0$

$0 \leq x < 18$

12. $\sqrt{3x + 1} \geq 8$

$x \geq 21$

Solve.

13. Ainsley and Ben each solve the inequality $\sqrt{x + 3} + 5 \leq 10$. Ainsley's solution is $x \leq 22$. Ben's solution is $-3 \leq x \leq 22$. Why are their solutions different? Which is correct?

Ben's solution is correct. Ainsley forgot that the radicand cannot be negative.