

Name _____ Date _____ Period _____

Extraneous Solutions and Real-World Applications - Practice

Algebra II | Unit 2 | Lesson 6 Practice | TEK A2.6.D, A2.6.E

Objective: I can check every candidate in the original equation, reject extraneous solutions, and solve real-world absolute value equations.

Section 1 — Recall

1. What is an extraneous solution?

2. Is $x = -3$ a solution to $|x + 1| = 2x + 8$? Show the check.

Left: $|-3 + 1| =$ _____ Right: $2(-3) + 8 =$ _____

Solution? _____

3. Is $x = -5$ a solution to $|x - 1| = 2x + 4$? Show the check.

Left: $|-5 - 1| =$ _____ Right: $2(-5) + 4 =$ _____

Solution? _____

4. In Desmos you graph $y_1 = |x - 1|$ and $y_2 = 2x + 4$ and they cross exactly once. How many real solutions does the equation have?

Section 2 — Apply

5. Recall Lesson 4: a bolt must be within 0.05 cm of 8 cm, giving $|x - 8| = 0.05$. Solve for both acceptable lengths.

$x =$ _____ or $x =$ _____

6. — Recall Lesson 4: an AI demand-forecasting model is trusted only within 30 units of an actual demand of 250 units, giving $|x - 250| = 30$. Solve for the two boundary predictions.

$x =$ _____ or $x =$ _____ units

7. Solve $|x + 3| = 2x + 1$, and check BOTH candidates.

Split: $x + 3 = 2x + 1$ OR $x + 3 =$ _____

Candidates: $x =$ _____ and $x =$ _____

After checking: _____ Set: { _____ }

Section 3 — Challenge

8. Solve $|x - 4| = 3x$, checking both candidates in the ORIGINAL equation. State the solution set.

Candidates: $x =$ _____ and $x =$ _____

After checking: _____ Set: { _____ }

9. Solve $|2x - 1| = x + 4$, check both, and describe what you would see in Desmos.

Candidates: $x = \underline{\hspace{1cm}}$ and $x = \underline{\hspace{1cm}}$

In Desmos: _____

Section 4 — Explain It

10. Lesson 5 equations like $|x - 5| = 9$ never produced an extraneous solution, but equations with a variable on BOTH sides sometimes do. Explain why.
