EXTEND

- Identify the error in solving the absolute value equation.
- Correct the error. Show your steps.
- Explain how one might have made the error.
- Justify the correct answer and steps.

$$|2x - 1| = 9$$

$$2x - 1 = 9 \qquad\qquad 2x - 1 = -9$$
$$\underline{+1 \quad +1} \qquad\qquad \underline{+1 \quad +1}$$

$$\frac{2x}{2} = \frac{10}{2} \qquad\qquad \frac{2x}{2} = \frac{\boxed{8}}{2} \quad \text{error}$$

$$x = 5 \qquad \text{or} \qquad x = 4$$

$$2x - 1 = -9$$
$$\underline{+1 \quad +1}$$
$$\frac{2x}{2} = \frac{-8}{2}$$
$$x = -4$$

Possible Student Responses:

- The negative sign was left out.
- Since -9 is farther from 0 than 1, you subtract 9 and 1 and make the answer negative.
- -9 plus 1 gives you -8.

- Identify the error in solving the absolute value equation.
- Correct the error. Show your steps.
- Explain how one might have made the error.
- Justify the correct answer and steps.

$$-3|x-4| -4 = 3$$
$$+4 \quad +4$$

$$\frac{-3|x-4|}{-3} = \frac{7}{-3}$$

$$|x-4| = -\frac{7}{3} \qquad \text{error}$$

$$x-4 = -\frac{7}{3} \qquad\qquad x-4 = \frac{7}{3}$$
$$+4 \quad +4 \qquad\qquad\quad +4 \quad +4$$

$$x = \frac{5}{3} \qquad \text{or} \qquad x = \frac{19}{3}$$

Possible Student Responses

- When the absolute value was isolated, it equals a negative number. So it is a ∅.

- Absolute Value equations cannot equal a negative number.

- Identify the error in solving the absolute value equation.
- Correct the error. Show your steps.
- Explain how one might have made the error.
- Justify the correct answer and steps.

$$|2x-3|+4=7$$

$$|2x-3|+4=7 \qquad\qquad \overset{\downarrow \text{ error}}{|2x-3|+4=-7}$$

$$\underline{\;\;+3\qquad\qquad +3\;\;} \qquad\qquad \underline{\;\;+3\qquad\qquad +3\;\;} \quad \text{error}$$

$$2x+4=10 \qquad\qquad\qquad 2x+4=-4$$
$$\underline{\;\;-4\qquad -4\;\;} \qquad\qquad\qquad \underline{\;\;-4\qquad\quad -4\;\;}$$

$$\frac{2x}{2}=\frac{6}{2} \qquad\qquad\qquad \frac{2x}{2}=\frac{-8}{2}$$

$$x=3 \qquad\qquad \text{or} \qquad\qquad x=-4$$

$$|2x-3|+4=7$$
$$\underline{\quad -4\quad -4\quad}$$
$$|2x-3|\quad =3$$

$$2x-3=3 \qquad\qquad\qquad 2x-3=-3$$
$$\underline{\;\;+3\quad +3\;\;} \qquad\qquad\qquad \underline{\;\;+3\quad +3\;\;}$$
$$\frac{2x}{2}=\frac{6}{2} \qquad\qquad\qquad\qquad \frac{2x}{2}=\frac{0}{2}$$
$$x=3 \qquad\qquad\qquad\qquad\qquad x=0$$

Possible Student Responses

· The equation was split before the absolute value was isolated, and added 3 from inside the absolute value instead of subtracting 4 from outside the absolute value