

Ch. 1-7 Absolute Value Equations

- Steps: ① Get |term| "by itself"
② Split |term| into 2 Equations

$$+() \quad | \quad -()$$

- ③ Solve Each Equation / Checks

EX 2
pg 55

$$\frac{4|x+2|}{4} = \frac{24}{4}$$

$$\begin{matrix} \oplus & & \ominus \\ |x+2| & = & 6 \end{matrix}$$

$$(x+2) = 6$$

$$x+2 = 6$$

$$\begin{matrix} -2 & -2 \end{matrix}$$

$$\boxed{x = 4}$$

$$\text{ck } 4|(4)+2| \stackrel{?}{=} 24$$

✓

$$-(x+2) = 6$$

$$-1(x+2) = 6$$

$$-x - 2 = 6$$

$$\begin{matrix} +2 & +2 \end{matrix}$$

$$-x = 8$$

$$\boxed{x = -8}$$

$$\text{ck } 4|(-8)+2| \stackrel{?}{=} 24$$

✓

More Examples

#1-3, Pg 57

① $|x| = 6$

② $9 = |x+5|$

③ $|3x| + 2 = 8$

EX2A $|x+3| + 4 = 4$

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* EX2B $5 = |x+2| + 8$

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* Why checks are mandatory!

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①

$$|x| = 6$$

$$\boxed{x = 6}$$

✓

$$-(x) = 6$$

$$\boxed{x = -6}$$

✓

②

$$9 = |x + 5|$$

ABS. VAL. EG.

⊕

Eg.

$$(x + 5) = 9$$

$$\boxed{x = 4}$$

✓

⊖

$$9 = -(x + 5)$$

$$9 = -x - 5$$

$$14 = -x$$

$$\boxed{x = -14}$$

✓

$$\textcircled{3} \quad \textcircled{|3x|} + 2 = 8$$

$$\quad \quad \quad -2 \quad | \quad -2$$

$$|3x| = 6$$

$\oplus$
↓

$$\frac{3x}{3} = \frac{6}{3}$$

$$x = 2$$

✓

$\ominus$
↓

$$-(3x) = 6$$

$$\frac{-3x}{-3} = \frac{6}{-3}$$

$$x = -2$$

$$x = \{-2, 2\}$$

SOLUTION SET

SET
NOTATION

EX 2A
P555

$$\begin{array}{cc} |x+3| & +4 = 4 \\ -4 & -4 \end{array}$$

$$\textcircled{+} \quad |x+3| = 0$$

$$\begin{array}{cc} x+3 & = 0 \\ -3 & -3 \end{array}$$

$$\boxed{x = -3}$$

✓

$\textcircled{-}$

$$-(x+3) = 0$$

$$\begin{array}{cc} -x-3 & = 0 \\ +3 & +3 \end{array}$$

$$\begin{array}{cc} -x & = 3 \\ \boxed{x = -3} \end{array}$$

$$\boxed{x = \{-3\}}$$

Ex 2b
pg 55

$$5 = |x+2| + 8$$

-8 -8

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

⊕

$$x+2 = -3$$

-2 -2

$$x = -5$$

~~FALSE~~

$$-(x+2) = -3$$

$$-x - 2 = -3$$

+2 +2

$$-x = -1$$

$$x = 1$$

~~FALSE~~

NO SOLUTION

$$\textcircled{1} \quad \frac{V}{\frac{1}{3}A} = \frac{\frac{1}{3}Ah}{\frac{1}{3}A} \quad \text{for } h$$

Examples
From
Qv. 34

$$\frac{3V}{A} = h$$

$$\textcircled{4} \quad \cancel{X} \frac{m}{\cancel{X}} = (k - b)X \quad \text{for } m$$

$$m = (k - b)X$$

$$m = kX - bX$$

$$\textcircled{2} \quad \begin{array}{c} P = +R - C \\ -R \quad -R \end{array} \quad \text{for } C$$

$$P - R = -C$$

$$\begin{array}{c} -P + R = C \\ R - P = C \end{array}$$