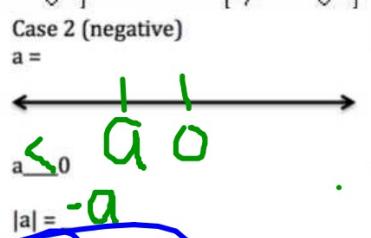
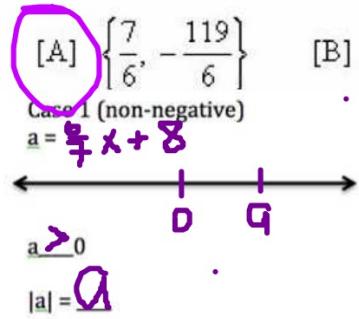


## AM: Solve absolute value eqns with 1-variable

$$\left| \frac{b}{7}x + 8 \right| = 9$$

1. Identify the solutions of the equation:  $\left| \frac{6}{7}x + 8 \right| + 3 = 12$



$$\begin{aligned} \frac{6}{7}x + 8 &= 9 \\ -8 &\quad -8 \\ \frac{6}{7}x &= 1 \\ \frac{6}{7} \cdot \frac{7}{6}x &= 1 \cdot \frac{7}{6} \\ x &= \frac{7}{6} \end{aligned}$$

$$\begin{aligned} -( \frac{6}{7}x + 8 ) &= 9 \\ -\frac{6}{7}x - 8 &= 9 \\ +8 &\quad +8 \\ -\frac{6}{7}x &= 17 \\ -\frac{7}{6} \cdot -\frac{6}{7}x &= 17 \cdot -\frac{7}{6} \\ x &= -\frac{119}{6} \end{aligned}$$

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## AM: Solve absolute value eqns with 1-variable

Solve:

2.  $|2x+9| = |3x-8|$

Case 1 (non-negative)

a =



a \_\_\_ 0

$|a| = \underline{\hspace{2cm}}$

Case 2 (negative)

a =



a \_\_\_ 0

$|a| = \underline{\hspace{2cm}}$

$$|2x+9| = |3x-8|$$

$2x+9$     
  $-(2x+9)$     
  $3x-8$     
  $-(3x-8)$

$$\textcircled{1} \quad 2x+9 = 3x-8 = 17$$

$$2x+9 = -3x+8 \\ +3x \quad +3x$$

$$\textcircled{2} \quad 2x+9 = -(3x-8) = -1/5$$

$$5x = -1/5$$

$$\textcircled{3} \quad -(2x+9) = (3x-8) = -2 = -1/5$$

$$x = -1/5$$

$$\textcircled{4} \quad -(2x+9) = -(3x-8) = 17$$

$$2x+9 = 3x-8$$

$$2x+9 = -(3x-8)$$

## AM: Solve absolute value eqns with 1-variable

3.  $|3 - 0.20x| + 1 = 20$

Case 1 (non-negative)

a =



a  $\underline{\quad}$  0

$|\underline{a}| = \underline{\quad}$

Case 2 (negative)

a =



a  $\underline{\quad}$  0

$|\underline{a}| = \underline{\quad}$

## AM: Solve absolute value eqns with 1-variable

4.  $\left| \frac{3}{4}x + 9 \right| = \left| \frac{1}{16}x + 5 \right|$

Case 1:

$$16 \left( \frac{3}{4}x + 9 \right) = \left( \frac{1}{16}x + 5 \right)^{16}$$

$$12x + 144 = x + 80$$

$$-x - 144 \quad -x - 144$$

$$11x = -64$$

$$\frac{11x}{11} = \frac{-64}{11}$$

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Case 2:

$$-\left( \frac{3}{4}x + 9 \right) = \frac{1}{16}x + 5$$

$$16 \left( -\frac{3}{4}x - 9 \right) = \left( \frac{1}{16}x + 5 \right)^{16}$$

$$-12x - 144 = x + 80$$

$$+12x \quad -80 \quad +12x \quad -80$$

$$-224 = 13x$$

$$\frac{-224}{13} = x$$

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$$|6x+2| = |2x+1|$$

Case 1:

$$\begin{array}{rcl} 6x+2 & = & 2x+1 \\ -2x-2 & & -2x-2 \end{array}$$

$$\frac{4x}{4} = \frac{-1}{4}$$

$$x = -\frac{1}{4}$$

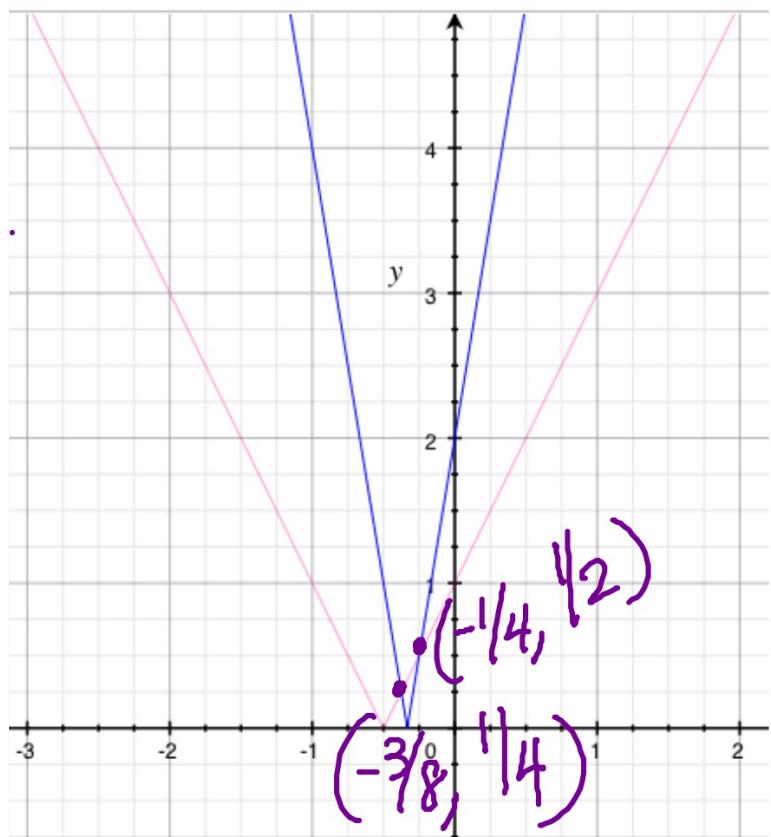
$$\begin{array}{rcl} 6x+2 & = & 0 \\ -2 & & -2 \\ 6x & = & -2 \\ \hline x & = & -\frac{1}{3} \end{array}$$

Case 2:

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

$$\begin{array}{rcl} -6x-2 & = & 2x+1 \\ +6x & & +6x \\ -3 & = & 8x \end{array}$$

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



$$|-5x+2| = \left|\frac{1}{3}x+1\right|$$

Case 1

$$\begin{aligned} -5x+2 &= 0 \\ -5x &= -2 \\ x &= \frac{2}{5} \end{aligned}$$

$$\begin{aligned} \frac{1}{3}x+1 &= 0 \\ \frac{1}{3}x &= -1 \\ x &= -3 \end{aligned}$$

$$3(-5x+2) = \left(\frac{1}{3}x+1\right)3$$

$$\begin{aligned} -5x+2 &= \frac{1}{3}x+1 \\ +5x &-1 \quad +5x \quad -1 \\ 0 &= \frac{16}{3}x \end{aligned}$$

$$\begin{aligned} -15x+6 &= x+3 \\ +15x &-3 +15x-3 \end{aligned}$$

$$\begin{aligned} \frac{3}{16} \cdot 1 &= \frac{16}{3}x \cdot \frac{3}{16} \\ \frac{3}{16} &= x \end{aligned}$$

$$\frac{3}{16} = \frac{16x}{16}$$

$$\frac{3}{16} = x$$

Case 2:

$$\begin{aligned} -(-5x+2) &= \frac{1}{3}x+1 \\ 3(-5x-2) &= (\frac{1}{3}x+1)3 \\ -15x-6 &= x+3 \end{aligned}$$

$$\begin{aligned} 14x &= 9 \\ x &= \frac{9}{14} \end{aligned}$$

