

WORKBOOK EXAMPLES

CHAPTER 3

MATH 1100

Don D. Kim

29 March 2020



Mizzou
University of Missouri

OUTLINE

1 §3.5: SOLVING EQUATIONS & INEQUALITIES w/ ABS. VALUE

EQUATIONS WITH ABSOLUTE VALUE

For $a > 0$ and an algebraic expression x :

EQUATIONS WITH ABSOLUTE VALUE

For $a > 0$ and an algebraic expression x :

$$|x| = a$$

EQUATIONS WITH ABSOLUTE VALUE

For $a > 0$ and an algebraic expression x :

$$|x| = a$$

is equivalent to

EQUATIONS WITH ABSOLUTE VALUE

For $a > 0$ and an algebraic expression x :

$$|x| = a$$

is equivalent to

$$x = a \text{ or } x = -a.$$

EXAMPLE

Solve

$$|x| = 5.$$

EXAMPLE

Solve

$$|x| = 5.$$

SOLUTION:

EXAMPLE

Solve

$$|x| = 5.$$

SOLUTION:

$$\Rightarrow x = 5, x = -5.$$

EXAMPLE

Solve

$$|5x| = 4.$$

EXAMPLE

Solve

$$|5x| = 4.$$

SOLUTION:

EXAMPLE

Solve

$$|5x| = 4.$$

SOLUTION:

$$\Rightarrow 5x = 4, 5x = -4$$

EXAMPLE

Solve

$$|5x| = 4.$$

SOLUTION:

$$\Rightarrow 5x = 4, 5x = -4$$

$$\Rightarrow x = \frac{4}{5}, x = -\frac{4}{5}.$$

EXAMPLE

Solve

$$|x - 3| = 5.$$

EXAMPLE

Solve

$$|x - 3| = 5.$$

SOLUTION:

EXAMPLE

Solve

$$|x - 3| = 5.$$

SOLUTION:

$$\Rightarrow x - 3 = 5, x - 3 = -5$$

EXAMPLE

Solve

$$|x - 3| = 5.$$

SOLUTION:

$$\Rightarrow x - 3 = 5, x - 3 = -5$$

$$\Rightarrow x = 8, x = -2.$$

EXAMPLE

Solve

$$|x + 2| - 5 = 9.$$

EXAMPLE

Solve

$$|x + 2| - 5 = 9.$$

SOLUTION:

EXAMPLE

Solve

$$|x + 2| - 5 = 9.$$

SOLUTION:

$$\Rightarrow |x + 2| = 14$$

EXAMPLE

Solve

$$|x + 2| - 5 = 9.$$

SOLUTION:

$$\Rightarrow |x + 2| = 14$$

$$\Rightarrow x + 2 = 14, x + 2 = -14$$

EXAMPLE

Solve

$$|x + 2| - 5 = 9.$$

SOLUTION:

$$\Rightarrow |x + 2| = 14$$

$$\Rightarrow x + 2 = 14, x + 2 = -14$$

$$\Rightarrow x = 12, x = -16.$$

EXAMPLE

Solve

$$|x - 4| + 3 = 9.$$

EXAMPLE

Solve

$$|x - 4| + 3 = 9.$$

SOLUTION:

EXAMPLE

Solve

$$|x - 4| + 3 = 9.$$

SOLUTION:

$$\Rightarrow |x - 4| = 6$$

EXAMPLE

Solve

$$|x - 4| + 3 = 9.$$

SOLUTION:

$$\Rightarrow |x - 4| = 6$$

$$\Rightarrow x - 4 = 6, x - 4 = -6$$

EXAMPLE

Solve

$$|x - 4| + 3 = 9.$$

SOLUTION:

$$\Rightarrow |x - 4| = 6$$

$$\Rightarrow x - 4 = 6, x - 4 = -6$$

$$\Rightarrow x = 10, x = -2.$$

EXAMPLE

Solve

$$9 - |x - 2| = 7.$$

EXAMPLE

Solve

$$9 - |x - 2| = 7.$$

SOLUTION:

EXAMPLE

Solve

$$9 - |x - 2| = 7.$$

SOLUTION:

$$\Rightarrow -|x - 2| = -2$$

EXAMPLE

Solve

$$9 - |x - 2| = 7.$$

SOLUTION:

$$\Rightarrow -|x - 2| = -2$$

$$\Rightarrow |x - 2| = 2$$

EXAMPLE

Solve

$$9 - |x - 2| = 7.$$

SOLUTION:

$$\Rightarrow -|x - 2| = -2$$

$$\Rightarrow |x - 2| = 2$$

$$\Rightarrow x - 2 = 2, x - 2 = -2$$

EXAMPLE

Solve

$$9 - |x - 2| = 7.$$

SOLUTION:

$$\Rightarrow -|x - 2| = -2$$

$$\Rightarrow |x - 2| = 2$$

$$\Rightarrow x - 2 = 2, x - 2 = -2$$

$$\Rightarrow x = 4, x = 0.$$

EXAMPLE

Solve

$$5 - |4x + 3| = 2.$$

EXAMPLE

Solve

$$5 - |4x + 3| = 2.$$

SOLUTION:

EXAMPLE

Solve

$$5 - |4x + 3| = 2.$$

SOLUTION:

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

EXAMPLE

Solve

$$5 - |4x + 3| = 2.$$

SOLUTION:

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

$$\Rightarrow |4x + 3| = 3$$

EXAMPLE

Solve

$$5 - |4x + 3| = 2.$$

SOLUTION:

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

$$\Rightarrow |4x + 3| = 3$$

$$\Rightarrow 4x + 3 = 3, 4x + 3 = -3$$

EXAMPLE

Solve

$$5 - |4x + 3| = 2.$$

SOLUTION:

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

$$\Rightarrow |4x + 3| = 3$$

$$\Rightarrow 4x + 3 = 3, 4x + 3 = -3$$

$$\Rightarrow x = 0, x = -\frac{3}{2}.$$

EXAMPLE

Solve

$$|x| < 5.$$

EXAMPLE

Solve

$$|x| < 5.$$

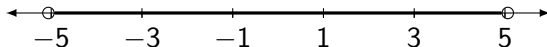
SOLUTION:

EXAMPLE

Solve

$$|x| < 5.$$

SOLUTION:



EXAMPLE

Solve

$$|x| < 5.$$

EXAMPLE

Solve

$$|x| < 5.$$

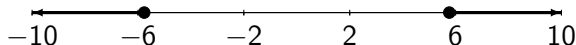
SOLUTION:

EXAMPLE

Solve

$$|x| < 5.$$

SOLUTION:



EXAMPLE

Solve

$$|x| < 5.$$

EXAMPLE

Solve

$$|x| < 5.$$

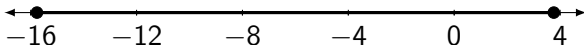
SOLUTION:

EXAMPLE

Solve

$$|x| < 5.$$

SOLUTION:



EXAMPLE

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$$|x| < 5.$$

EXAMPLE

Solve

$$|x| < 5.$$

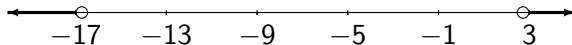
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Solve

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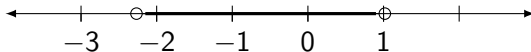
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$$|x| < 5.$$

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