

Name: <u>Key</u>	Date:
Topic:	Class:

Main Ideas/Questions	Notes
WARM-UP	<p>1. If $x = 7$, what are the possible values of x?</p> <p style="text-align: center;">7 or -7</p> <p>2. If $x = -4$, what are the possible values of x?</p> <p>None - x cannot be -4 away from zero on the number line</p>
STEPS TO SOLVE Absolute Value Equations	① ISOLATE the absolute value expression.
	② CREATE TWO CASES. Set the "inside" equal to both the positive and negative value of the number on the opposite side of the equal sign.
	③ SOLVE both equations.
	④ CHECK for extraneous solutions.
What are Extraneous Solutions?	Solutions that do not work in the original equation.

Directions: Solve each equation. Be sure to check for extraneous solutions.

<p>3. $x-9 =5$</p> <p>$x-9=5$ $x-9=-5$</p> <p>$x=14$ $x=4$</p> <p>$x=\{4, 14\}$</p> <p>$14-9 =5 \checkmark$ $4-9 =5 \checkmark$</p>	<p>4. $3= 2k+7$</p> <p>$2k+7=3$ $2k+7=-3$</p> <p>$2k=-4$ $2k=-10$</p> <p>$k=-2$ $k=-5$</p> <p>$k=\{-5, -2\}$</p> <p>$3= -4+7 \checkmark$ $3= -10+7 \checkmark$</p>
<p>5. $y-1 +17=23$</p> <p>$y-1 =6$</p> <p>$y-1=6$ $y-1=-6$</p> <p>$y=7$ $y=-5$</p> <p>$y=\{-5, 7\}$</p> <p>$6+17=23 \checkmark$ $6+17=23 \checkmark$</p>	<p>6. $3 m+8 =39$</p> <p>$m+8 =13$</p> <p>$m+8=13$ $m+8=-13$</p> <p>$m=5$ $m=-21$</p> <p>$m=\{-21, 5\}$</p> <p>$3(13)=39 \checkmark$ $3(-13)=-39 \checkmark$</p>
<p>7. $16 r-5 =-32$</p> <p>$r-5 =-2$</p> <p style="text-align: center; border: 1px solid black; padding: 5px;">No Solution!</p>	<p>8. $\frac{ y-10 }{-2}=-6$</p> <p>$y-10 =12$</p> <p>$y-10=12$ $y-10=-12$</p> <p>$y=22$ $y=-2$</p> <p>$y=\{-2, 22\}$</p> <p>$\frac{12}{-2}=-6 \checkmark$ $\frac{-12}{-2}=6 \checkmark$</p>

$$9. -5 = |8 - p| - 11$$

$$6 = |8 - p|$$

$$8 - p = 6$$

$$-p = -2$$

$$p = 2$$

$$-5 = 6 - 11 \checkmark$$

$$8 - p = -6$$

$$-p = -14$$

$$p = 14$$

$$p = \{2, 14\}$$

$$-5 = 6 - 11 \checkmark$$

$$10. \frac{|3a + 12|}{9} = 0$$

$$|3a + 12| = 0$$

$$3a + 12 = 0$$

$$3a = -12$$

$$a = -4$$

$$\frac{|-12 + 12|}{9} = 0 \checkmark$$

$$a = \{-4\}$$

$$11. 9 - 4|c + 10| = -15$$

$$-4|c + 10| = -24$$

$$|c + 10| = 6$$

$$c + 10 = 6$$

$$c = -4$$

$$c + 10 = -6$$

$$c = -16$$

$$c = \{-4, -16\}$$

$$9 - 4|6| = -15$$

$$9 - 24 = -15 \checkmark$$

$$9 - 4|-6| = -15$$

$$9 - 24 = -15 \checkmark$$

$$12. -16 = -12\left|\frac{k}{5}\right| + 8$$

$$-24 = -12\left|\frac{k}{5}\right|$$

$$2 = \left|\frac{k}{5}\right|$$

$$2 = \frac{k}{5}$$

$$10 = k$$

$$-2 = \frac{k}{5}$$

$$-10 = k$$

$$k = \{10, -10\}$$

$$13. |3x - 9| = x + 1$$

$$3x - 9 = x + 1$$

$$2x - 9 = 1$$

$$2x = 10$$

$$x = 5$$

$$3x - 9 = -x - 1$$

$$4x - 9 = -1$$

$$4x = 8$$

$$x = 2$$

$$x = \{2, 5\}$$

$$|15 - 9| = 5 + 1 \checkmark$$

$$|6 - 9| = 2 + 1 \checkmark$$

$$14. 2|h + 8| = 14h$$

$$|h + 8| = 7h$$

$$h + 8 = 7h$$

$$8 = 6h$$

$$\frac{4}{3} = h$$

$$2\left|\frac{28}{3}\right| = 14\left(\frac{4}{3}\right) \checkmark$$

$$h + 8 = -7h$$

$$8 = -8h$$

$$\cancel{-1 = h}$$

$$h = \left\{\frac{4}{3}\right\}$$

$$2|7| = 14(-1) \times$$

(Extraneous)

$$15. |8 - 2n| - 5n = n + 2$$

$$|8 - 2n| = 6n + 2$$

$$8 - 2n = 6n + 2$$

$$6 = 8n$$

$$\frac{3}{4} = n$$

$$n = \left\{\frac{3}{4}\right\}$$

$$\left|8 - \frac{6}{4}\right| - \frac{15}{4} = \frac{3}{4} + 2 \checkmark$$

$$8 - 2n = -6n - 2$$

$$10 = -4n$$

$$\cancel{-\frac{5}{2} = n} \times$$

(Extraneous)

$$16. -4w - 2 = |6w + 20|$$

$$-4w - 2 = 6w + 20$$

$$-2 = 10w + 20$$

$$-22 = 10w$$

$$-\frac{11}{5} = w$$

$$w = \left\{-9, -\frac{11}{5}\right\}$$

$$\frac{44}{5} - 2 = \left|-\frac{66}{5} + 20\right| \checkmark$$

$$4w + 2 = 6w + 20$$

$$2 = 2w + 20$$

$$-18 = 2w$$

$$-9 = w$$

$$36 - 2 = |-54 + 20| \checkmark$$