

Directions: Solve each of the following. Be sure to check for extraneous solutions.

1.  $|y - 1| + 17 = 23$

2.  $16|r - 5| = -32$

3.  $-\frac{1}{2}|x - 10| = -6$

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

5.  $2|x + 8| = 14x$

6.  $|8 - 2n| - 5n = n + 2$

7.  $-2x - 7 > 1$  or  $x - 2 \geq -1$

8.  $-13 \leq 3 + 8p \leq 11$

9.  $|x + 6| > 7$

10.  $-10|2r - 1| \leq -60$

11.  $2 - 9|p + 7| > -16$

12.  $4|8y + 7| - 9 < 91$

13. A cereal bar is listed as containing 200 calories. A laboratory tested a sample of the bars and found that the actual calorie content varied by as much as 28 calories. Write and solve an absolute value inequality for the calorie content of the bars.

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$y - 1 = 6$  or  $y - 1 = -6$   
 $y = 7$     $y = -5$

$16(r - 5) = -32$   
 $r - 5 = -2$   
**NO SOLUTION**

$|x - 10| = 12$

$3a + 12 = 0$

$x - 10 = 12$  or  $x - 10 = -12$   
 $x = 22$     $x = -2$

$3a = -12$   
 $a = -4$

$x + 8 = 7x$     $x + 8 = -7x$

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

$8 = 6x$     $8 = -8x$   
 $x = \frac{4}{3}$     $x = -1$  (extraneous)

$8 - 2n = 6n + 2$     $8 - 2n = -6n - 2$   
 $-8n = -6$     $4n = -10$   
 $n = \frac{3}{2}$     $n = -\frac{5}{2}$  (extraneous)

$-2x - 7 > 1$  or  $x - 2 \geq -1$   
 $x < -4$  or  $x \geq 1$

$-2 \leq 8p \leq 8$   
 $-2 \leq p \leq 1$

$x + 6 > 7$  or  $x + 6 < -7$   
 $x > 1$  or  $x < -13$

$|2r - 1| \geq 6$   
 $2r - 1 \geq 6$  or  $2r - 1 \leq -6$   
 $r \geq \frac{7}{2}$  or  $r \leq -\frac{5}{2}$

$x < -4$  or  $x \geq 1$   
 $(-\infty, -4) \cup [1, \infty)$

$|2r - 1| \geq 6$   
 $2r - 1 \geq 6$  or  $2r - 1 \leq -6$   
 $r \geq \frac{7}{2}$  or  $r \leq -\frac{5}{2}$

$x > 1$  or  $x < -13$   
 $(-\infty, -13) \cup (1, \infty)$

$|r - \frac{1}{2}| \geq \frac{5}{2}$   
 $r - \frac{1}{2} \geq \frac{5}{2}$  or  $r - \frac{1}{2} \leq -\frac{5}{2}$   
 $r \geq 3$  or  $r \leq -2$

$2 - 9|p + 7| > -16$   
 $-9|p + 7| > -18$     $p < -5$  and  $p > -9$

$|8y + 7| < 25$   
 $8y + 7 < 25$     $8y + 7 > -25$   
 $y < \frac{9}{4}$  and  $y > -\frac{9}{4}$

$|p + 7| < 2$  and  $p + 7 > -2$   
 $(-9, -5)$

$|y - \frac{9}{4}| < \frac{5}{4}$   
 $y < \frac{9}{4} + \frac{5}{4}$  and  $y > \frac{9}{4} - \frac{5}{4}$   
 $y < 2$  and  $y > -\frac{1}{2}$

$|c - 200| \leq 28$

$c - 200 \leq 28$

$c - 200 \geq -28$

$c \leq 228$

and

$c \geq 172$

$[172, 228]$