

Solving Absolute Value Equations

Unit 2: Equations and Inequalities

Solve each equation:

<p>1. $m = 5$</p> <p style="text-align: center;">$m = 5$</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$m = 5$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$m = -5$</div> </div>	<p>2. $n + 4 = 6$</p> <p style="text-align: center;">$n = 2$</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$n = 2$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$n = -2$</div> </div>
<p>3. $5 + 3 x = 35$</p> <p style="text-align: center;">$3 x = 30$</p> <p style="text-align: center;">$x = 10$</p> <p style="text-align: center;">So...</p> <p style="text-align: center;">$x = 10$</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$x = 10$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$x = -10$</div> </div>	<p>4. $\left \frac{n}{10}\right = 3$</p> <p style="text-align: center;">$\left[\frac{n}{10} = 3\right] \cdot 10$</p> <p style="text-align: center;">$\left[\frac{n}{10} = -3\right] \cdot 10$</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$n = 30$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$n = -30$</div> </div>
<p>5. $n - 6 = 13$</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$n - 6 = 13$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$n - 6 = -13$</div> </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$n = 19$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$n = -7$</div> </div>	<p>6. $2r = 8$</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$2r = 8$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$2r = -8$</div> </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$r = 4$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$r = -4$</div> </div>
<p>7. $10p + 4 = 34$</p> <p style="text-align: center;">$10p = 30$</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$10p = 30$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$10p = -30$</div> </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$p = 3$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$p = -3$</div> </div>	<p>8. $\left \frac{n}{2}\right - 6 = -5$</p> <p style="text-align: center;">$\left \frac{n}{2}\right = 1$</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$2 \cdot \left[\frac{n}{2} = 1\right] \cdot 2$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$2 \cdot \left[\frac{n}{2} = -1\right] \cdot 2$</div> </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$n = 2$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$n = -2$</div> </div>
<p>9. $5v - 10 = 20$</p> <p style="text-align: center;">$5v = 30$</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$5v = 30$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$5v = -30$</div> </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$v = 6$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$v = -6$</div> </div>	<p>10. $-7 m - 8 + 6 = -1$</p> <p style="text-align: center;">$-7 m - 8 = -7$</p> <p style="text-align: center;">$m - 8 = 1$</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$m - 8 = 1$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$m - 8 = -1$</div> </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$m = 9$</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">$m = 7$</div> </div>

<p>11. $-4 + 8 -6x = 44$</p> $\frac{-4 + 8 -6x }{8} = \frac{44}{8}$ $ -6x = 6$ $\frac{-6x}{-6} = \frac{6}{-6} \quad \frac{-6x}{-6} = \frac{-6}{-6}$ <p>$x = -1$ $x = 1$</p>	<p>12. $3 - 3 10 + v = -12$</p> $\frac{3 - 3 10 + v }{-3} = \frac{-12}{-3}$ $ 10 + v = 5$ $\frac{10 + v}{-10} = \frac{5}{-10} \quad \frac{10 + v}{-10} = \frac{-5}{-10}$ <p>$v = -5$ $v = -15$</p>
<p>13. $7x - 8 = 36$</p> $\frac{7x - 8}{+8} = \frac{36}{+8} \quad \frac{7x - 8}{+8} = \frac{-36}{+8}$ $\frac{7x}{7} = \frac{44}{7} \quad \frac{7x}{7} = \frac{-28}{7}$ <p>$x = \frac{44}{7}$ $x = -4$</p>	<p>14. $3 + 8m = 51$</p> $\frac{3 + 8m}{-3} = \frac{51}{-3} \quad \frac{3 + 8m}{-3} = \frac{-51}{-3}$ $\frac{8m}{8} = \frac{48}{8} \quad \frac{8m}{8} = \frac{-54}{8}$ <p>$m = 6$ $m = -\frac{27}{4}$</p>
<p>15. $10 - 7x = 80$</p> $\frac{10 - 7x}{-10} = \frac{80}{-10} \quad \frac{10 - 7x}{-10} = \frac{-80}{-10}$ $\frac{-7x}{-7} = \frac{70}{-7} \quad \frac{-7x}{-7} = \frac{-90}{-7}$ <p>$x = -10$ $x = \frac{90}{7}$</p>	<p>16. $-7 2m + 6 = -98$</p> $\frac{-7 2m + 6 }{-7} = \frac{-98}{-7}$ $ 2m + 6 = 14$ $\frac{2m + 6}{-6} = \frac{14}{-6} \quad \frac{2m + 6}{-6} = \frac{-14}{-6}$ $\frac{2m}{2} = \frac{8}{2} \quad \frac{2m}{2} = \frac{-20}{2}$ <p>$m = 4$ $m = -10$</p>
<p>17. $-10 5 - 5b = -50$</p> $\frac{-10 5 - 5b }{-10} = \frac{-50}{-10}$ $ 5 - 5b = 5$ $\frac{5 - 5b}{-5} = \frac{5}{-5} \quad \frac{5 - 5b}{-5} = \frac{-5}{-5}$ $\frac{-5b}{-5} = \frac{0}{-5} \quad \frac{-5b}{-5} = \frac{-10}{-5}$ <p>$b = 0$ $b = 2$</p>	<p>18. $9v - 9 - 9 = 18$</p> $\frac{ 9v - 9 - 9}{+9} = \frac{18}{+9}$ $ 9v - 9 = 27$ $\frac{9v - 9}{+9} = \frac{27}{+9} \quad \frac{9v - 9}{+9} = \frac{-27}{+9}$ $\frac{9v}{9} = \frac{36}{9} \quad \frac{9v}{9} = \frac{-18}{9}$ <p>$v = 4$ $v = -2$</p>
<p>19. $2 4n + 5 + 1 = 43$</p> $\frac{2 4n + 5 + 1}{-1} = \frac{43}{-1}$ $2 4n + 5 = 42$ $ 4n + 5 = 21$ $\frac{4n + 5}{-5} = \frac{21}{-5} \quad \frac{4n + 5}{-5} = \frac{-21}{-5}$ $\frac{4n}{4} = \frac{16}{4} \quad \frac{4n}{4} = \frac{-26}{4}$ <p>$n = 4$ & $n = -\frac{13}{2}$</p>	<p>20. $3 3x + 4 + 3 = 18$</p> $\frac{3 3x + 4 + 3}{-3} = \frac{18}{-3}$ $3 3x + 4 = 15$ $ 3x + 4 = 5$ $\frac{3x + 4}{-4} = \frac{5}{-4} \quad \frac{3x + 4}{-4} = \frac{-5}{-4}$ $\frac{3x}{3} = \frac{1}{3} \quad \frac{3x}{3} = \frac{-9}{3}$ <p>$x = \frac{1}{3}$ & $x = -3$</p>