

Solving Multi Step Equations

Unit 2: Equations and Inequalities

Solve each equation:

<p>1. $0 = -3r + 3r$</p> <p>$0 = 0$</p> <p>Since no variable and it's a true statement,</p> <p style="text-align: center; border: 1px solid black; display: inline-block; padding: 2px;">ALL REAL NUMBERS</p>	<p>2. $2n + 1 + 8n = 11$</p> $\begin{array}{r} 10n + 1 = 11 \\ -1 \quad -1 \\ \hline 10n = 10 \\ \frac{10n}{10} = \frac{10}{10} \\ \hline n = 1 \end{array}$ <p style="text-align: center; border: 1px solid black; display: inline-block; padding: 2px;">n = 1</p>
<p>3. $8x + 3x = 3x + 8x$</p> <p>$11x = 11x$</p> <p>Since the left and right side are EXACTLY the same,</p> <p style="text-align: center; border: 1px solid black; display: inline-block; padding: 2px;">ALL REAL NUMBERS</p>	<p>4. $-p - 15 = p + 2 - 7$</p> $\begin{array}{r} -p - 15 = p - 5 \\ +p + 5 \quad +p + 5 \\ \hline -10 = 2p \\ \frac{-10}{2} = \frac{2p}{2} \\ \hline -5 = p \end{array}$ <p style="text-align: center; border: 1px solid black; display: inline-block; padding: 2px;">-5 = p</p>
<p>5. $-8(-6 - 8x) = 176$</p> $\begin{array}{r} 48 + 64x = 176 \\ -48 \quad -48 \\ \hline 64x = 128 \\ \frac{64x}{64} = \frac{128}{64} \\ \hline x = 2 \end{array}$ <p style="text-align: center; border: 1px solid black; display: inline-block; padding: 2px;">x = 2</p>	<p>6. $-84 = -7(r + 4)$</p> $\begin{array}{r} -84 = -7r - 28 \\ +28 \quad +28 \\ \hline -56 = -7r \\ \frac{-56}{-7} = \frac{-7r}{-7} \\ \hline 8 = r \end{array}$ <p style="text-align: center; border: 1px solid black; display: inline-block; padding: 2px;">8 = r</p>
<p>7. $6(1 - 8a) = 102$</p> $\begin{array}{r} 6 - 48a = 102 \\ -6 \quad -6 \\ \hline -48a = 96 \\ \frac{-48a}{-48} = \frac{96}{-48} \\ \hline a = -2 \end{array}$ <p style="text-align: center; border: 1px solid black; display: inline-block; padding: 2px;">a = -2</p>	<p>8. $2n + 8(n + 2) = 86$</p> $\begin{array}{r} 2n + 8n + 16 = 86 \\ 10n + 16 = 86 \\ -16 \quad -16 \\ \hline 10n = 70 \\ \frac{10n}{10} = \frac{70}{10} \\ \hline n = 7 \end{array}$ <p style="text-align: center; border: 1px solid black; display: inline-block; padding: 2px;">n = 7</p>
<p>9. $3x - 39 = -5(1 - 4x)$</p> $\begin{array}{r} 3x - 39 = -5 + 20x \\ -3x + 5 \quad +5 - 3x \\ \hline -34 = 17x \\ \frac{-34}{17} = \frac{17x}{17} \\ \hline -2 = x \end{array}$ <p style="text-align: center; border: 1px solid black; display: inline-block; padding: 2px;">-2 = x</p>	<p>10. $-7(n - 6) + 8 = 25 - 2n$</p> $\begin{array}{r} -7n + 42 + 8 = 25 - 2n \\ -7n + 50 = 25 - 2n \\ +7n - 25 \quad -25 + 7n \\ \hline 25 = 5n \\ \frac{25}{5} = \frac{5n}{5} \\ \hline 5 = n \end{array}$ <p style="text-align: center; border: 1px solid black; display: inline-block; padding: 2px;">5 = n</p>

$$11. 7x + 40 = -7 + 5(1 - 7x)$$

$$7x + 40 = -7 + 5 - 35x$$

$$7x + 40 = -2 - 35x$$

$$\begin{array}{r} +35x - 40 \\ -40 + 35x \end{array}$$

$$\frac{42x}{42} = \frac{-42}{42}$$

$$\boxed{x = -1}$$

$$12. -4(1 + 2x) + 5 = 1 - 8x$$

$$-4 - 8x + 5 = 1 - 8x$$

$$1 - 8x = 1 - 8x$$

Same on both sides,

$$\boxed{\text{ALL REAL NUMBERS}}$$

$$13. 64 = -6(2x - 4) + 5(8 - 7x)$$

$$64 = -12x + 24 + 40 - 35x$$

$$64 = -47x + 64$$

$$\begin{array}{r} -64 \\ -64 \end{array}$$

$$0 = -47x$$

$$\begin{array}{r} -47 \\ -47 \end{array}$$

$$\boxed{0 = x}$$

$$14. -3(x + 4) - 6(x + 3) = -75$$

$$-3x - 12 - 6x - 18 = -75$$

$$-9x - 30 = -75$$

$$\begin{array}{r} +30 \\ +30 \end{array}$$

$$\frac{-9x}{-9} = \frac{-45}{-9}$$

$$\boxed{x = 5}$$

$$15. -8(6n + 7) - 5(1 - 7n) = 4$$

$$-48n - 56 - 5 + 35n = 4$$

$$-13n - 61 = 4$$

$$\begin{array}{r} +61 \\ +61 \end{array}$$

$$\frac{-13n}{-13} = \frac{65}{-13}$$

$$\boxed{n = -5}$$

$$16. 2(1 + 5b) - 2(1 + 4b) = -2$$

$$2 + 10b - 2 - 8b = -2$$

$$0 + 2b = -2$$

$$\frac{2b}{2} = \frac{-2}{2}$$

$$\boxed{b = -1}$$

$$17. -2(x + 1) + 4(6x - 5) = x + 1 - 2$$

$$-2x - 2 + 24x - 20 = x - 1$$

$$22x - 22 = x - 1$$

$$\begin{array}{r} -x + 22 \\ -x + 22 \end{array}$$

$$\frac{21x}{21} = \frac{21}{21}$$

$$\boxed{x = 1}$$

$$18. 8(3a + 2) - 2 = 5(4a - 6)$$

$$24a + 16 - 2 = 20a - 30$$

$$24a + 14 = 20a - 30$$

$$\begin{array}{r} -20a - 14 \\ -20a - 14 \end{array}$$

$$\frac{4a}{4} = \frac{-44}{4}$$

$$\boxed{a = -11}$$

$$19. 3 - (k - 4) = -7(-k + 7)$$

$$3 - k + 4 = 7k - 49$$

$$7 - k = 7k - 49$$

$$\begin{array}{r} +49 + k \\ +k + 49 \end{array}$$

$$\frac{56}{8} = \frac{8k}{8}$$

$$\boxed{7 = k}$$

$$20. 8a - 4(2a + 5) = -4(a + 3) + 4a - 8$$

$$8a - 8a - 20 = -4a - 12 + 4a - 8$$

$$0a - 20 = 0a - 20$$

$$-20 = -20$$

True statement with no variable

$$\boxed{\text{ALL REAL NUMBERS}}$$