

## Honors Algebra 1 Unit 3 Test Review (Lessons 1-14)

Solve the following equations for  $x$ . State any excluded values where necessary.

$$1. \begin{array}{r} 2x - 5 = -43 \\ +5 \quad +5 \\ \hline 2x = -38 \\ \hline x = -19 \end{array}$$

$$2. \begin{array}{r} -5(x+2) = 3-x \\ -5x - 10 = 3 - x \\ +5x \quad +5x \\ \hline -10 = 3 + 4x \\ -3 \quad -3 \\ \hline -13 = 4x \\ \hline -\frac{13}{4} = x \end{array}$$

$$3. \begin{array}{r} \frac{x}{5} \cdot \frac{x+6}{10} \\ \hline 10x = 5(x+6) \\ 10x = 5x + 30 \\ -5x \quad -5x \\ \hline 5x = 30 \\ \hline x = 6 \end{array}$$

$$4. \begin{array}{r} -93 = 2(6x+1)+1 \\ -93 = 12x+2+1 \\ -93 = 12x+3 \\ -3 \quad -3 \\ \hline -96 = 12x \\ \hline -8 = x \end{array}$$

$$* 5. \frac{x-1}{x+5} = \frac{2}{7} \quad \boxed{x \neq -5}$$

$$\begin{array}{r} 7(x-1) = 2(x+5) \\ 7x - 7 = 2x + 10 \\ -2x \quad -2x \\ \hline 5x - 7 = 10 \\ +7 \quad +7 \\ \hline 5x = 17 \\ \hline x = \frac{17}{5} \end{array}$$

$$* 6. \frac{-x+4}{x-4} = 3 \quad \boxed{x \neq 4}$$

$$\begin{array}{r} -x+4 = 3(x-4) \\ -x+4 = 3x-12 \\ +x \quad +x \\ \hline 4 = 4x-12 \\ +12 \quad +12 \\ \hline 16 = 4x \\ \hline 4 = x \end{array}$$

No solution

$$7. \frac{3x}{5} - \frac{2x+15}{3} = 4 \cdot \frac{15}{15}$$

$$\begin{array}{r} 3x - 10x = 60 \\ -7x = 60 \\ \hline x = -\frac{60}{7} \end{array}$$

$$8. \begin{array}{r} 5[2-3(4+2x)] = -2(x-3) \\ 5[2-12-6x] = -2x+6 \\ 5[-10-6x] = -2x+6 \\ -50-30x = -2x+6 \\ +30x \quad +30x \\ \hline -50 = 28x+6 \\ -6 \quad -6 \\ \hline -56 = 28x \\ \hline -2 = x \end{array}$$

LCD  
15

$$9. \frac{x}{2} + \frac{3}{8} = \frac{3x}{4} - 1$$

$$\begin{array}{r} 4x + 3 = 6x - 8 \\ -4x \quad -4x \\ \hline 3 = 2x - 8 \\ +8 \quad +8 \\ \hline 11 = 2x \\ \hline \frac{11}{2} = x \end{array}$$

$$10. \frac{1}{3}(6x+15) - 2 = 2(x+1) + 1$$

$$\begin{array}{r} 2x + 5 - 2 = 2x + 2 + 1 \\ 2x + 3 = 2x + 3 \\ -2x \quad -2x \\ \hline 3 = 3 \end{array}$$

Infinite solutions

Solve using the zero product property.

11.  $(4x + 8)(x - 7) = 0$

$4x + 8 = 0$        $x - 7 = 0$

$x = -2$        $x = 7$

12.  $2x(3x - 1) = 0$

$2x = 0$        $3x - 1 = 0$

$x = 0$        $x = \frac{1}{3}$

Solve the following absolute value equations.

13.  $|-8 + n| = 16$

$-8 + n = 16$        $-8 + n = -16$   
 $+8$        $+8$        $+8$        $+8$

$n = 24$        $n = -8$

14.  $2|x + 7| - 3 = -9$

$\frac{2}{2}|x + 7| = \frac{-6}{2}$

$|x + 7| = -3$

No solution

15.  $9\left|\frac{p}{6}\right| + 2 = 5$

$\frac{9}{9}\left|\frac{p}{6}\right| = \frac{3}{9}$

$\left|\frac{p}{6}\right| = \frac{1}{3}$

$\frac{p}{6} = \frac{1}{3}$        $\frac{p}{6} = -\frac{1}{3} \Rightarrow p = -2$   
 $p = 2$

16.  $\frac{4|3 - 2y|}{4} = \frac{52}{4}$

$|3 - 2y| = 13$

$\frac{-3 - 2y}{-3} = \frac{13}{-3}$        $\frac{3 - 2y}{-3} = \frac{-13}{-3}$

$\frac{-2y}{-2} = \frac{10}{-2}$        $\frac{-2y}{-2} = \frac{16}{2}$

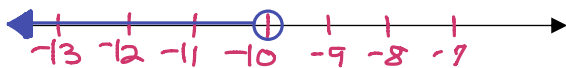
$y = -5$        $y = 8$

Solve and write your answer in interval notation. Then graph your solution.

17.  $x + 7 < -3$

$-7$        $-7$

$x < -10$        $(-\infty, -10)$

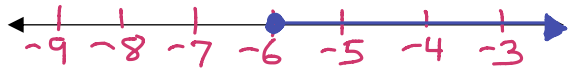


18.  $-3(x + 4) \leq 6$

$-3x - 12 \leq 6$   
 $+12$        $+12$   
 $\frac{-3x}{-3} \leq \frac{18}{-3}$

Flip the sign

$x \geq -6$        $[-6, \infty)$



19.  $17 > 2x + 1$

$\frac{16}{2} > \frac{2x}{2}$

$8 > x$

or

$x < 8$        $(-\infty, 8)$



20.  $4 - x \geq 5x - 2$

$4 \geq 6x - 2$   
 $+2$        $+2$

$\frac{6}{6} \geq \frac{6x}{6}$

$1 \geq x$   
 $x \leq 1$        $(-\infty, 1]$



Solve each equation for y.

$$\begin{aligned}
 21. \quad & 4x - 6y = 18 \\
 & \quad \quad \quad -4x \quad \quad \quad -4x \\
 & \quad \quad \quad \underline{-6y} = \underline{-4x + 18} \\
 & \quad \quad \quad \underline{-6} \quad \quad \quad \underline{-6} \quad \quad \quad \underline{-6} \\
 & \quad \quad \quad y = \frac{4}{6}x - 3 \\
 & \quad \quad \quad y = \frac{2}{3}x - 3
 \end{aligned}$$

$$\begin{aligned}
 22. \quad & \frac{2y}{w} + 3 = f \\
 & \quad \quad \quad -3 \quad \quad \quad -3 \\
 & \quad \quad \quad \underline{\frac{2y}{w}} = \underline{(f-3) \cdot w} \\
 & \quad \quad \quad \underline{2y} = \underline{\frac{wf-3w}{2}} \\
 & \quad \quad \quad \underline{2} \quad \quad \quad \underline{2} \\
 & \quad \quad \quad y = \frac{wf-3w}{2}
 \end{aligned}$$

23. Write the reason that supports each step of the following proof.

$\frac{2(3(x+6) - 18)}{6} = 7$	Original Statement
$2(3(x+6) - 18) = 42$	Multiplication Property of equality
$2(3x + 18 - 18) = 42$	Distributive Property
$2(3x) = 42$	Combine like terms
$6x = 42$	Multiply ( $2 \times 3$ )
$x = 7$	Division Property of equality