Algebra 1 SOL Review Session

Day: 4   **Topics:** Equations (A.4 a, c, e), Inequalities (A.5 a, c), and Properties (A.4 a, b, A.5 a)
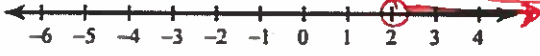
Key Concepts:
- The types of solutions possible for equations, inequalities, and literal equations.
- Using Desmos to help determine the solutions of equations and inequalities.
- Identifying properties used to solve equations and inequalities.

Guided Practice:

Finding Solutions (Handout)

Properties (Handout)

Independent Practice:

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1. Solve.

$$24a - 22 = -4(1 - 6a)$$

$24a - 22 = -4 + 24a$

$-24a \qquad -24a$

$-22 \neq -4$ ⟶ **No solution**

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2. Find the value of the variable that makes the equation true.

$$5n + 34 = -2(1 - 7n)$$

$5n + 34 = -2 + 14n$

$-14n \qquad\quad -14n$

$-9n + 34 = -2$

$\quad -34 \quad -34$

$-9n = -36$ **n = 4**

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3. Find and graph the solution set to the inequality.

$$6 - 4(6n + 7) \geq 122$$

$6 - 24n - 28 \geq 122 \qquad -24n \geq 144$

$-24n - 22 \geq 122 \qquad \dfrac{-24n}{-24} \quad \dfrac{144}{-24}$

$\qquad +22 \quad +22$ **n ≤ -6**

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4. Solve and graph the inequality.

$$-x < -x + 7(x - 2)$$

$-x < -x + 7x - 14 \qquad \dfrac{-7x}{-7} < \dfrac{-14}{-7}$

$-x < 6x - 14$

$-6x \quad -6x$ **x > 2**

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5. Josh and Sacha had a football game last weekend. Josh had twice as many tackles as Sacha, and together they had a total of 15 tackles. How many tackles did they each make?

$j = 2c$

$c + 2c = 15$

$3c = 15$

$c = 5$

Josh: 10

Sacha: 5

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6. Margot works on the weekends babysitting and washing cars. She earns $25 each Saturday from washing cars. She earns $12 an hour babysitting. If she wants to earn at least $60 this weekend, how many hours must she spend babysitting?

$25 + 12b \leq 60$

$-25 \qquad\quad -25$

$\dfrac{12b}{12} \leq \dfrac{35}{12}$ $b \leq 2$hrs 55 min.

7.
Step 1: $-4 = 5 - 3z$
Step 2: $-4 - 5 = 5 - 5 - 3z$
Step 3: $-9 = -3z$
Step 4: $\dfrac{-9}{-3} = \dfrac{-3z}{-3}$
Step 5: $3 = z$

Which property is used in step 2?

Subtraction Property of Equality

Which property is used in step 4?

Division Property of Equality

8.
Step 1: $\dfrac{-v+9}{3} = 8$
Step 2: $\left(\dfrac{-v+9}{3}\right)3 = (8)3$
Step 3: $-v + 9 = 24$
Step 4: $-v + 9 - 9 = 24 - 9$
Step 5: $-v = 15$
Step 6: $(-v)(-1) = 15(-1)$
Step 7: $v = -15$

Which property is used in step 2?

Multiplication Property of Equality

Which property is used in step 6?

Multiplication Property of Equality

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9. A mistake is made while solving an equation. Between which two steps is the mistake made?

Step 1: $3(2x + 1) - (x - 4) = 2$
Step 2: $6x + 3 - x + 4 = 2$
Step 3: $5x - 1 = 2$
Step 4: $5x - 1 + 1 = 2 + 1$
Step 5: $5x = 3$
Step 6: $\frac{5x}{5} = \frac{3}{5}$
Step 7: $x = \frac{3}{5}$

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10. A mistake is made while solving an inequality. Between which two steps is the mistake made?

Step 1: $-\frac{1}{3}(x - 9) \geq 11$
Step 2: $-\frac{1}{3}x + 3 \geq 11$
Step 3: $-\frac{1}{3}x + 3 - 3 \geq 11 - 3$
Step 4: $-\frac{1}{3}x \geq 8$
Step 5: $(-3)\left(-\frac{1}{3}x\right) \geq (8)(-3)$
Step 6: $x \geq -24$

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11. Solve the equation $Ax + By = C$ for y.

$-Ax \qquad -Ax$

$\dfrac{By}{B} = \dfrac{C - Ax}{B}$

$y = \dfrac{C - Ax}{B}$

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12. The formula, $F = \frac{9}{5}C + 32$ can be used to convert temperatures in degrees Celsius to degrees Fahrenheit. Rewrite the formula to solve for C.

$F = \frac{9}{5}C + 32$
$-32 \qquad -32$
$\frac{5}{9}(F - 32) = \left(\frac{9}{5}C\right)\frac{5}{9}$
$\frac{5}{9}(F - 32) = C$

$C = \frac{5}{9}(F - 32)$

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More Independent Practice (Multiple Choice)

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Michelle correctly solved a linear equation and the last line of her work was: $1 = 2$

Which statement best describes the solution to the equation Michelle was solving?

A. The solution is 1.   B. The solution is 2.

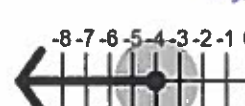C. The equation has infinitely many solutions.
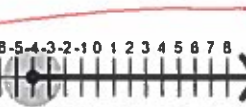
D. The equation has no solutions.

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Solve for x:

$$6x - 11 - 13x < 7 - 5x$$

$-7x - 11 < 7 - 5x$
$+5x \qquad\qquad +5x$
$-2x - 11 < 7$
$-2x < 18$
$\frac{-2x}{-2} < \frac{18}{-2}$

A. $x < 9$ B. $x > 9$ $x > -9$

C. $x < -9$ D. $x > -9$

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Graph the solution set to this inequality.

$$-(x + 4) - 2 > 2x + 6$$

$-x - 4 - 2 > 2x + 6$
$-x - 6 > 2x + 6$
$-2x \qquad -2x$
$-3x - 6 > 6$
$+6 \qquad +6$
$-3x > 12$
$\frac{-3x}{-3} \quad \frac{12}{-3}$
$x < -4$

A. (number line -8 to 0)

B. (number line -8 to 0)

C. (number line -8 to 8)

D. (number line -6 to 8)

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Kamala re-wrote the expression $(5x + 7) + 8$ as $5x + (7 + 8)$. Which property justifies this action?

A. Commutative Property of Addition

B. Associative Property of Addition

C. Identity Property of Addition

D. Inverse Property of Addition

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The formula, $A = \frac{1}{2}bh$ can be used to find the area of a triangle. Which of the equations below shows this formula solved for b?

A. $b = \frac{1}{2}Ah$ B. $b = \frac{2A}{h}$

C. $b = 2Ah$ D. $b = \frac{2}{Ah}$

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Which of the following values for the variable would make the equation $-5(4x - 2) = -2(3 + 6x)$ true?

$-20x + 10 = -6 - 12x$
$+12x \qquad\qquad +12x$
$-8x + 10 = -6$
$-8x = -16$
$\frac{-8x}{-8} = \frac{-16}{-8}$
$x = 2$

A. 2   B. $\frac{1}{2}$

C. -2 D. $-\frac{1}{2}$

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