

Algebra 1 Honors Unit 1: Linear Equations and Functions Date: \_\_\_\_\_

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$2x + 3 = 7$  (Solve for  $x$ )

$2x + 3 - 3 = 7 - 3$  (Subtract 3 from both sides)

$2x = 4$  (Simplify)

$x = 2$  (Divide both sides by 2)

$5x - 2 = 8$  (Solve for  $x$ )

$5x - 2 + 2 = 8 + 2$  (Add 2 to both sides)

$5x = 10$  (Simplify)

$x = 2$  (Divide both sides by 5)

$3x + 4 = 2x + 10$  (Solve for  $x$ )

$3x + 4 - 2x = 2x + 10 - 2x$  (Subtract  $2x$  from both sides)

$x + 4 = 10$  (Simplify)

$x + 4 - 4 = 10 - 4$  (Subtract 4 from both sides)

$x = 6$  (Simplify)

$7x - 1 = 6x + 5$  (Solve for  $x$ )

$7x - 1 - 6x = 6x + 5 - 6x$  (Subtract  $6x$  from both sides)

$x - 1 = 5$  (Simplify)

$x - 1 + 1 = 5 + 1$  (Add 1 to both sides)

$x = 6$  (Simplify)

Write the equation of the line passing through the points  $(1, 2)$  and  $(3, 4)$ .

Step 1: Find the slope  $m$ .

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - 2}{3 - 1} = \frac{2}{2} = 1$

Step 2: Use the point-slope form.

$y - y_1 = m(x - x_1)$

$y - 2 = 1(x - 1)$

Step 3: Simplify to slope-intercept form.

$y - 2 = x - 1$

$y = x + 1$

Step 4: Write the equation of the line.

$y = x + 1$

Step 5: Verify the equation.

Check point  $(1, 2)$ :  $2 = 1 + 1$  ✓

Check point  $(3, 4)$ :  $4 = 3 + 1$  ✓

Write the equation of the line passing through the points  $(2, 3)$  and  $(4, 7)$ .

Step 1: Find the slope  $m$ .

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7 - 3}{4 - 2} = \frac{4}{2} = 2$

Step 2: Use the point-slope form.

$y - y_1 = m(x - x_1)$

$y - 3 = 2(x - 2)$

Step 3: Simplify to slope-intercept form.

$y - 3 = 2x - 4$

$y = 2x - 1$

Step 4: Write the equation of the line.

$y = 2x - 1$

Step 5: Verify the equation.

Check point  $(2, 3)$ :  $3 = 2(2) - 1$  ✓

Check point  $(4, 7)$ :  $7 = 2(4) - 1$  ✓