Algebra I

7-2
Solving Systems:
The Substitution Method

Solve by the substitution method.

1) $y = 6x$
$x + y = 28$

$x + (6x) = 28$

$\dfrac{7x}{7} = \dfrac{28}{7}$

$x = 4$

$y = 6(4)$
$y = 24$

After we solve for one of the two variables, we SUBSTITUTE its value in one of the two original equations. Choose whichever seems easiest to solve for the remaining variable.

$\{(4, 24)\}$

Answers should be written as a point in alphabetical order.

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2) $3x + 1 = y$
$2x + 3y = 25$

$2x + 3(3x + 1) = 25$
$2x + 9x + 3 = 25$
$11x + 3 - 3 = 25 - 3$
$\dfrac{11x}{11} = \dfrac{22}{11}$
$x = 2$

$3(2) + 1 = y$
$6 + 1 = y$
$7 = y$

$\{(2, 7)\}$

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3) $2r + 3s = 0$
$r + 5 = 6s$

$r + 5 - 5 = 6s - 5$
$r = 6s - 5$

$2(6s - 5) + 3s = 0$
$12s - 10 + 3s = 0$
$15s - 10 + 10 = 0 + 10$
$\dfrac{15s}{15} = \dfrac{10}{15}$
$s = \dfrac{2}{3}$

$r = 6\left(\dfrac{2}{3}\right) - 5$
$r = 4 - 5 = -1$

$\left\{\left(-1, \dfrac{2}{3}\right)\right\}$

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4) $c - d = 8$
$\left(\dfrac{c}{5} = d + 4\right) 5$
$c = 5d + 20$

$(5d + 20) - d = 8$
$4d + 20 = 8$
$4d + 20 - 20 = 8 - 20$
$\dfrac{4d}{4} = \dfrac{-12}{4}$
$d = -3$

$c = 5(-3) + 20$
$c = -15 + 20$
$c = 5$

$\{(5, -3)\}$

Assignment:
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4-16 even,
20-28 even,
31-33 all.