Name __key__

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (4 points) A medieval alchemist's love potion calls for a number of eyes of newt and toes of frog, the total being 21, but with twice as many newt eyes as frog toes. How many of each are required? Set up a system of linear equations that corresponds to the problem situation and use any method to solve the system.

X = # of NEWT EYES
y = # of FROG TOES

$X + y = 21$
$2y = X$

$2y + y = 21$
$3y = 21$
$y = 7$
$X = 14$

14 EYES
&
7 TOES

2. (3 points) Solve by substitution or elimination: $\begin{cases} 3x - 2y = 8 \\ 5x + 3y = 7 \end{cases}$ ← MULT BY 3 ← MULT BY 2

$3(2) - 2y = 8$
$-2y = 2$
$y = -1$

$9x - 6y = 24$
$10x + 6y = 14$
_____
$19x = 38$
$X = 2$

$X = 2, y = -1$
$(2, -1)$

3. (3 points) Solve by substitution or elimination: $\begin{cases} x - y + 4z = -4 \\ 4x + y - 2z = -1 \\ -y + 2z = -3 \end{cases}$

$4x + y - 2z = -1$
$-y + 2z = -3$
_____
$4x = -4$
$X = -1$

$-1 - y + 4z = -4$
$-4 + y - 2z = -1$
_____
$-5 + 2z = -5$
$z = 0$

$-y + 2(0) = -3$
$y = 3$

$X = -1, y = 3, z = 0$
$(-1, 3, 0)$