Name: _____ Date _____ #42 Solve Using Elimination

On your own paper, solve each system of equations using linear combination/elimination method.

handwritten: See next pages for work

1. $11x - 3y = 19$

   $11x + 2y = -1$

   $\left(\frac{7}{11}, -4\right)$

2. $4x - 7y = -5$

   $3x - 2y = -7$

   $(-3, -1)$

3. $4a + 5b = 10$

   $3a + 10b = 5$

   $a = 3$
   $b = -\frac{2}{5}$

4. $6c + 8d = 4$

   $9c + 10d = 7$

   $c = \frac{4}{3}$
   $d = -\frac{1}{2}$

5. $-6x + 8y = -25$

   $3x - 4y = -25$

   $\emptyset$

6. $s + 2t = -7$

   $3s - 8t = 7$

   $s = -3$
   $t = -2$

7. $2x + 3y = 12$

   $3x + 2y = 13$

   $\left(\frac{93}{15}, -\frac{14}{5}\right)$

8. $a + 5b = 8$

   $3a + 7b = 0$

   $a = -7$
   $b = 3$

9. $x - 3y = -10$

   $2x + y = 1$

   $(-1, 3)$

* 10. $m - 4n = -5$

   $m = 2n - 4$

   $m = -3$
   $n = \frac{1}{2}$

11. Write a system of equations and solve. The talent show ticket committee sold a total of 805 tickets in advance. The student tickets cost $3 each and the adult tickets cost $4 each. If the total receipts were $2970, how many of each type of ticket were sold?

    handwritten: 250 student 555 adult

12. The sum of 2 numbers is 25. Their difference is 7. Find the numbers.

    handwritten: 16 and 9

13. Solve using any method. Bob has $24 more than twice as much as Susie. Together they have $150. How much money does each have?

    handwritten: Bob = $108
    Susie = $42

① $11x - 3y = 19$ → $11x - 3(-4) = 19$

$\quad 11x + 2y = -1$

$\quad\quad -5y = 20$

$\quad\quad \dfrac{-5y}{-5} = \dfrac{20}{-5}$

$\quad\quad y = -4$

$11x + 12 = 19$

$\quad -12 \quad -12$

$\dfrac{11x}{11} = \dfrac{7}{11}$

$x = 7/11$

$(7/11, -4)$

② $3(4x - 7y = -5)$ → $12x - 21y = -15$

$\quad 4(3x - 2y = -7)$ → $12x - 8y = -28$

$\quad\quad 3x - 2(-1) = -7$

$\quad\quad 3x + 2 = -7$

$\quad\quad\quad -2 \quad -2$

$\quad\quad \dfrac{3x}{3} = \dfrac{-9}{3}$

$\quad\quad x = -3$

$\dfrac{-13y}{-13} = \dfrac{13}{-13}$

$y = -1$

$(-3, -1)$

③ $2(4a + 5b = 10)$ → $\quad 8a + 10b = 20$

$\quad 3a + 10b = 5$ copy $\quad 3a + 10b = 5$

$\quad\quad\quad\quad\quad\quad \dfrac{5a}{5} = \dfrac{15}{5}$

$\quad\quad 3(3) + 10b = 5$

$\quad\quad 9 + 10b = 5 \quad\quad\quad a = 3$

$\quad\quad -9 \quad\quad -9$

$\quad\quad \dfrac{10b}{10} = \dfrac{-4}{10}$

$\quad\quad b = -2/5$

$a = 3$

$b = -2/5$

④ $3(6c + 8d = 4) \rightarrow 18c + 24d = 12$ $c = 4/3$

$2(9c + 10d = 7) \rightarrow 18c + 20d = 14$ $d = -\frac{1}{2}$

$$\frac{4d}{4} = \frac{-2}{4}$$

$d = -\frac{1}{2}$

$9c + 10(-\frac{1}{2}) = 7$

$9c - 5 = 7$

$\quad +5 \quad +5$

$$\frac{9c}{9} = \frac{12}{9}$$

$c = 4/3$

⑤ $-6x + 8y = -25$ just copy $\rightarrow -6x + 8y = -25$ ϕ

$2(3x - 4y = -25) \rightarrow 6x - 8y = -50$

$$0 = -75$$

False

⑥ $3(S + 2t = -7) \rightarrow 3S + 6t = -21$ $S = -3$

$3S - 8t = 7$ copy $3S - 8t = 7$ $t = -2$

$$\frac{14t}{14} = \frac{-28}{14}$$

$t = -2$

$S + 2(-2) = -7$

$S - 4 = -7$

$\quad +4 \quad +4$

$S = -3$

⑦ $3(2x + 3y = 17) \rightarrow 6x + 9y = 12$

$2(3x + 2y = 13) \rightarrow 6x + 4y = 26$ $\left(\frac{93}{15}, \frac{-14}{5}\right)$

$$\frac{5y}{5} = \frac{-14}{5}$$

$3x + 2(-14/5) = 13$

$3x - 28/5 = 65/5$ $y = -14/5$

$\quad +28/5 \quad +28/5$

$$\frac{3x}{3} = \frac{93}{5} \cdot \frac{1}{3}$$

$x = 93/15$

⑧ $(a+5b=8)3 \rightarrow 3a+15b=24$

$3a+7b=0$ copy $\underline{\quad 3a+7b=0\quad}$

$a=-7$
$b=3$

$a+5(3)=8$

$\dfrac{8b}{8}=\dfrac{24}{8}$

$a+15=8$

$\underline{-15\quad-15}$

$b=3$

$a=-7$

⑨ $(x-3y=-10)2 \rightarrow 2x-6y=-20$

$2x+y=1$ copy $\underline{\quad -2x+y=1\quad}$

$\dfrac{-7y}{-7}=\dfrac{-21}{-7}$

$(-1,3)$

$2x+3=1$

$\underline{-3\quad-3}$

$y=3$

$\dfrac{2x}{2}=\dfrac{-2}{2}$

$x=-1$

✳ ⑩ $m-4n=-5$ copy $m-4n=-5$

$m=2n-4$ $\longrightarrow$ $\underline{\quad -m-2n=4\quad}$

$m=-3$
$n=\frac{1}{2}$

not
3rd
form

$\underline{-2n\quad-2n}$

$m=2(\frac{1}{2})-4$

$\dfrac{-2n}{-2}=\dfrac{-1}{-2}$

would use
substitution
on test

$m=1-4$

$n=\frac{1}{2}$

$m=-3$

11 s: # student tickets sold (250)
a: # of adult tickets sold (555)

$3 \cdot (s + a) = (805) \cdot 3 \rightarrow 3s + 3a = 2415$
$3s + 4a = 2970$ copy $3s + 4a = 2970$

$$\frac{-a}{-1} = \frac{-555}{-1}$$

$a = 555$ sub in top one

$s + 555 = 805$
$\underline{-555 \quad -555}$
$s = 250$

12 x: 1st # 16
y: 2nd # 9

sum $x + y = 25$
diff $x - y = 7$

$$\frac{2y}{2} = \frac{18}{2}$$

$y = 9$ sub in top one $x + 9 = 25$
$\underline{-9 \quad -9}$
$x = 16$

13 B: $ Bob has
S: $ Susie has $42

$B = 24 + 2S$ $B + S = 150$

smart choice is subst. b/c B is isolated

$B = 24 + 2(42)$ $24 + 2S + S = 150$
$B = 24 + 84$ $24 + 3S = 150$
$B = 108$ $\underline{-24 \qquad -24}$
$$\frac{3S}{3} = \frac{126}{3}$$
$S = 42$