Key

Math 1

Name _____

Date _____

3-2 and 3-3 Solving Systems Practice

Solve the following systems of equations:

1. $\begin{cases} y = 4x - 7 \\ y = x - 4 \end{cases}$ **(1, -3)**

$4x - 7 = x - 4$

$3x = 3$

$x = 1$

$y = (1) - 4$

$y = -3$

2. $\begin{cases} 4x - 2y = -4 \\ x + 5y = 10 \rightarrow x = 10 - 5y \end{cases}$ **(0, 2)**

$4(10 - 5y) - 2y = -4$

$40 - 20y - 2y = -4$

$40 - 22y = -4$

$-22y = -44$

$y = 2$

$x = 10 - 5(2)$

$x = 10 - 10$

$x = 0$

3. $2\begin{cases} 4x - 3y = -8 \\ 3\begin{cases} -6x + 2y = 7 \end{cases} \end{cases}$ $8x - 6y = -16$, $-18x + 6y = 21$

$-10x = 5$

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

(-0.5, 2)

$4(-0.5) - 3y = -8$

$-2 - 3y = -8$

$-3y = -6$

$y = 2$

4. $\begin{cases} y = -5x - 15 \\ y = 2x + 6 \end{cases}$ **(-3, 0)**

$2x + 6 = -5x - 15$

$7x = -21$

$x = -3$

$y = 2(-3) + 6$

$y = 0$

5. $\begin{cases} 2x - 3y = 10 \rightarrow 2x - 3y = 10 \\ 3\begin{cases} -2x + y = -6 \end{cases} \end{cases}$ $-6x + 3y = -18$

$-4x = -8$

$x = 2$

~~(1, -8)~~

(2, -2)

$-2(2) + y = -6$

$-4 + y = -6$

$y = -2$

6. $\begin{cases} x - 4y = -9 \rightarrow x = -9 + 4y \\ -3x - 2y = -15 \end{cases}$ **(3, 3)**

$-3(-9 + 4y) - 2y = -15$

$27 - 12y - 2y = -15$

$27 - 14y = -15$

$-14y = -42$

$y = 3$

$x = -9 + 4(3)$

$x = 3$

7. $\begin{cases} 2x+4y=8 \\ 3x-5y=-43 \end{cases}$

$5(2x+4y=8) \rightarrow 10x+20y=40$

$4(3x-5y=-43) \rightarrow 12x-20y=-172$

$22x = -132$

$x = -6$

$2(-6)+4y=8$

$-12+4y=8$

$4y=20$

$y=5$

$(-6, 5)$

8. $\begin{cases} 6x-y=1 \\ -3x+4y=-4 \end{cases}$

$4(6x-y=1) \rightarrow 24x-4y=4$

$21x = 0$

$x = 0$

$6(0)-y=1$

$-y=1$

$y=-1$

$(0, -1)$

9. $\begin{cases} 2x-y=-2 \\ -4x+y=1 \end{cases}$

$-2x = -1$

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

$2(\frac{1}{2})-y=-2$

$1-y=-2$

$-y=-3$

$y=3$

$(\frac{1}{2}, 3)$

10. $\begin{cases} 2x-4y=-1 \\ x=8y-2 \end{cases}$

$2(8y-2)-4y=-1$

$16y-4-4y=-1$

$12y=3$

$y=\frac{3}{12}=\frac{1}{4}$

$x=8(\frac{1}{4})-2$

$x=2-2=0$

$(0, \frac{1}{4})$

11. $\begin{cases} -6x-2y=-2 \\ 3x+y=1 \end{cases}$

$2(3x+y=1) \rightarrow 6x+2y=2$

$0=0$ ✓

Infinitely many solutions.

These equations produce the same line!

12. $\begin{cases} x-4y=-1 \\ -3x-2y=-11 \end{cases}$

$3(x-4y=-1) \rightarrow 3x-12y=-3$

$-14y=-14$

$y=1$

$x-4(1)=-1$

$x-4=-1$

$x=3$

$(3, 1)$

13. $\begin{cases} 4x+3y=18 \\ 3x+2y=14 \end{cases}$

$-2(4x+3y=18) \rightarrow -8x-6y=-36$

$3(3x+2y=14) \rightarrow 9x+6y=42$

$x = 6$

$(6, -2)$

$3(6)+2y=14$

$18+2y=14$

$2y=-4$

$y=-2$

14. $\begin{cases} 4x+6y=8 \\ 6x+9y=12 \end{cases}$

$6(4x+6y=8) \rightarrow 24x+36y=48$

$-4(6x+9y=12) \rightarrow -24x-36y=-48$

$0=0$ ✓

Infinitely many solutions

Same line!

15. $\begin{cases} y=2x-1 \\ 4x+6y=10 \end{cases}$ $(1, 1)$

$4x+6(2x-1)=10$

$4x+12x-6=10$

$16x=16$

$x=1$

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

16. $\begin{cases} 3x+4y=9 \\ y=x-3 \end{cases}$ $(3, 0)$

$3x+4(x-3)=9$

$3x+4x-12=9$

$7x=21$

$x=3$

$y=(3)-3=0$

17. $\begin{cases} y=-x+16 \\ y=-7x-8 \end{cases}$ $(-4, 20)$

$-x+16=-7x-8$

$6x=-24$

$x=-4$

$y=-(-4)+6$

$y=4+16=20$

18. $\begin{cases} 8x-14y=5 \\ x=3y \end{cases}$ $\left(\frac{3}{2}, \frac{1}{2}\right)$ or $(1.5, 0.5)$

$8(3y)-14y=5$

$24y-14y=5$

$10y=5$

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

$x=3\left(\frac{1}{2}\right)$

$x=\frac{3}{2}$

19. $\begin{cases} 4x-2y=-4 \\ -8x+2y=1 \end{cases}$

$2(4x-2y=-4) \rightarrow 8x-4y=-8$

$-8x+2y=1$

$-2y=-7$

$y=3.5$

$(0.75, 3.5)$

$4x-2(3.5)=-4$

$4x-7=-4$

$4x=3$

$x=\frac{3}{4}$

20. $\begin{cases} 2x-8y=-2 \\ -3x+12y=-22 \end{cases}$

$3(2x-8y=-2) \rightarrow 6x-24y=-6$

$2(-3x+12y=-22) \rightarrow -6x+24y=-44$

$0=-50$ ✗

No solution

Parallel lines; never intersect!