

Name Key

Date _____

LESSON 3.2

Solve the system using the substitution method.

1. $x + 2y = 6$
 $3x - 2y = 2$
 $x = -2y + 6 \rightarrow x = -2(2) + 6$
 $3(-2y + 6) - 2y = 2$ $(x=2)$
 $-6y + 18 - 2y = 2$
 $-8y = -16$ $(2, 2)$
 $y = 2$

2. $x + 3y = 3 \rightarrow x = -3y + 3$
 $2x + 4y = 6$
 $2(-3y + 3) + 4y = 6$
 $-6y + 6 + 4y = 6$
 $-2y = 0$
 $y = 0$ $(3, 0)$
 $x = -3(0) + 3$
 $x = 3$

3. $4x + y = 7$ $y = -4x + 7$
 $2x + 5y = -1$
 $2x + 5(-4x + 7) = -1$
 $2x - 20x + 35 = -1$ $(2, -1)$
 $-18x = -36$
 $x = 2$
 $y = -4(2) + 7 = -1$

4. $2x - 3y = 3$
 $-2x + y = -4$
 $y = 2x - 4$ $y = 2(\frac{9}{4}) - 4$
 $2x - 3(2x - 4) = 3$ $= \frac{1}{2}$
 $2x - 6x + 12 = 3$
 $-4x = -9$
 $x = \frac{9}{4}$ $(\frac{9}{4}, \frac{1}{2})$

5. $3x + 2y = -2$
 $6x - y = 6$
 $y = 6x - 6 \rightarrow y = 6(\frac{2}{3}) - 6$
 $3x + 2(6x - 6) = -2$ $= -2$
 $3x + 12x - 12 = -2$
 $15x = 10$
 $x = \frac{2}{3}$ $(\frac{2}{3}, -2)$

6. $8x + 2y = 2$
 $x + 3y = 14 \rightarrow x = -3y + 14$
 $8(-3y + 14) + 2y = 2$
 $-24y + 112 + 2y = 2$
 $-22y = -110$
 $y = 5$ $x = -3(5) + 14 = -1$
 $(5, -1)$

Solve the system using the elimination method.

7. $-3x + 3y = 3$
 $2x + y = 9$
 $4y = 12$
 $y = 3$
 $3x + 3 = 9$
 $3x = 6$
 $x = 2$ $(2, 3)$

8. $5x - y = -9$
 $2x + y = 2$
 $7x = -7$
 $x = -1$ $(-1, 4)$
 $2(-1) + y = 2$
 $y = 4$

9. $-5x + 12y = 20$
 $(x - 2y = -6) \cdot 5$
 $-5x + 12y = 20$
 $5x - 10y = -30$
 $2y = -10$
 $y = -5$ $(-16, -5)$
 $x - 2(-5) = -6$
 $x + 10 = -6$
 $x = -16$

10. $4x - 2y = -2$
 $2(6x + y = 3)$
 $4x - 2y = -2$
 $12x + 2y = 6$
 $16x = 8$
 $x = \frac{1}{2}$ $(\frac{1}{2}, 2)$
 $6(\frac{1}{2}) + y = 3$
 $3 + y = 3$
 $y = 0$

11. $(3x + 2y = 1) \cdot 3$
 $4x + 6y = 7$
 $-9x - 6y = -3$
 $4x + 6y = 7$
 $-5x = 4$
 $x = -\frac{4}{5}$ $(-\frac{4}{5}, \frac{17}{10})$
 $3(-\frac{4}{5}) + 2y = 1$
 $-\frac{12}{5} + 2y = 1$
 $2y = \frac{17}{5}$
 $y = \frac{17}{10}$

12. $(7x - 3y = 6)$
 $7(2x + 5y = -10)$
 $14x - 6y = 12$
 $-14x + 35y = -70$
 $29y = -58$
 $y = -2$
 $7x - 3(-2) = 6$
 $7x + 6 = 6$
 $7x = 0$
 $x = 0$ $(0, -2)$

Solve the system using any algebraic method.

13. $5x + 7y = -2$
 $2x - 7y = 9$

$(1, -1)$

14. $x + 3y = 1$
 $3x + 7y = 1$

$(-2, 1)$

15. $4x + 6y = 8$
 $-2(2x + 3y = 3)$

$\frac{4x + 6y = 8}{-4x - 6y = -6}$
 $0 = 2$
 no solution

16. $8x - 5y = -17$
 $-2x + y = 6$

$(-6, 5, 7)$
 or
 $(-\frac{13}{2}, 7)$

17. $3x - 8y = 0$
 $-2x + 5y = -2$

$(16, 6)$

18. $4x - 6y = 2$
 $5x + 3y = 1$

$(\frac{2}{7}, -\frac{1}{7})$

19. $2(2x - 5y = 3)$
 $-4x + 10y = -6$

$\frac{4x - 10y = 6}{-4x + 10y = -6}$
 $0 = 0$

Infinitely many solutions

20. $8x + 3y = 10$
 $-6x + y = -12$

$(\frac{23}{13}, \frac{-18}{13})$

21. $5x + 4y = -18$
 $2x + 3y = -24$

$(6, -12)$

24. **Birthday Gift** You and your sister decide to combine your weekly overtime earnings to buy a birthday gift for your mother. Your overtime rate is \$18 per hour and your sister's overtime rate is \$24 per hour. The total amount earned for the gift was \$288. If you worked two more hours of overtime than your sister, how many overtime hours did each of you work?

$\$288 = 18x + 24y$

$x = y + 2$

$288 = 18(y + 2) + 24y$

$288 = 18y + 36 + 24y$

$252 = 42y$

$y = 6$
 $x = 6 + 2$
 $x = 8$

you work 8 hours
 sis works 6 hours