

Unit 4 Exam Review

Short Answer

Solve the system of equations using substitution.

1. $y = 2x + 3$
 $y = 3x + 1$

$$\begin{array}{r} 2x + 3 = 3x + 1 \\ -2x \quad -2x \\ \hline 3 = 1x + 1 \\ -1 \quad -1 \\ \hline 2 = x \end{array}$$

$$y = 2(2) + 3 = 4 + 3$$

$y = 7$

$(2, 7)$

2. $y = 2x - 10$
 $y = 4x - 8$

$$\begin{array}{r} 2x - 10 = 4x - 8 \\ -2x \quad -2x \\ \hline -10 = 2x - 8 \\ +8 \quad +8 \\ \hline -2 = 2x \\ -2 = 2x \end{array}$$

$$y = 2(-1) - 10 = -2 - 10$$

$y = -12$

$(-1, -12)$

Solve the system using elimination.

3. $2x - 2y = -8$
 $x + 2y = -1$

$$\begin{array}{r} 2x - 2y = -8 \\ x + 2y = -1 \\ \hline 3x = -9 \\ x = -3 \end{array}$$

$$\begin{array}{r} -3 + 2y = -1 \\ +3 \quad +3 \\ \hline 2y = 2 \\ y = 1 \end{array}$$

$y = 1$

$(-3, 1)$

4. $3x - 4y = -24$
 $x + y = -1$

$$\begin{array}{r} 3x - 4y = -24 \\ 4x + 4y = -4 \\ \hline 7x = -28 \\ x = -4 \end{array}$$

$$\begin{array}{r} -4 + y = -1 \\ +4 \quad +4 \\ \hline y = 3 \end{array}$$

$y = 3$

$(-4, 3)$

5. $-10x - 3y = -18$
 $-7x - 8y = 11$

$$\begin{array}{r} -80x - 24y = -144 \\ 21x + 24y = -33 \\ \hline -59x = -177 \\ x = 3 \end{array}$$

$$\begin{array}{r} -7(3) - 8y = 11 \\ -21 - 8y = 11 \\ +21 \quad +21 \\ \hline -8y = 32 \\ y = -4 \end{array}$$

$y = -4$

$(3, -4)$

6. Tell whether the system has no solution, one solution, or infinitely many solutions.

$y = -x - 5$
 $y = -x - 3$

no solutions - parallel lines same slope, diff y-ints

7. Tell whether the system has *no solution*, *one solution*, or *infinitely many solutions*.

$y = 2x - 3$
 $y = 5x - 4$ one solution

8. Solve the system of equations.

$3x + 2y = 7$
 $y = -3x + 11$

$3x + 2(-3x + 11) = 7$
 $3x - 6x + 22 = 7$
 $-3x + 22 = 7$
 $-22 - 22$

$y = -3(5) + 11$
 $= -15 + 11$
 $y = -4$

$(5, -4)$

9. Solve the system of equations.

$5x + 2y = 13$
 $5x + 4y = 11$

$5x + 2y = 13$
 $-5x - 4y = -11$
 $-2y = 2$
 $y = -1$

$-3x = -15$
 $x = 5$

$5x + 2(-1) = 13$
 $5x - 2 = 13$
 $+2 + 2$
 $5x = 15$
 $x = 3$

$(3, -1)$

10. By what number should you multiply the first equation to solve using elimination?

$-5x - 4y = -31$
 $-15x + 3y = -33$

-3

11. Is $(5, -2)$ a solution of the linear inequality?

$y \geq 4x - 5$

NO

$-2 \geq 4(5) - 5$
 $-2 \geq 20 - 5$
 $-2 \geq 15$ False

12. Write the following inequality in slope-intercept form.

$-15x - 3y \geq -12$

$+15x + 15x$
 $-3y \geq -15x - 12$
 $-3y \geq -15x - 12$
 $\frac{-3y}{-3} \geq \frac{-15x}{-3} - \frac{12}{-3}$

$y \leq -5x + 4$

13. The grocery store sells apples for \$4.50 a pound and bananas for \$4.00 a pound. Write an equation in standard form for the weights of apples a and bananas b that a customer could buy with \$16.

$4.50a + 4.00b = 16$

14. At the beginning of the year, you have a balance of \$350 in your bank account. Each month you deposit \$50.

- (a) Write an equation for this situation.

$y = 50x + 350$

- (b) Use the equation to find the balance in June. Hint: June is $x = 6$.

$y = 50(6) + 350$
 $= 300 + 350$

$y = \$650$

Are the graphs of the lines in the pair parallel? Show work to back up your answer.

15. $y = -\frac{4}{5}x + 15$ Circle your answer: YES NO
 $-8x - 10y = -14$
 $+8x \quad +8x$
 $-10y = 8x - 14$ $y = -\frac{4}{5}x + \frac{7}{5}$
 $\frac{-10y}{-10} = \frac{8x-14}{-10}$

Tell whether the lines for each pair of equations are parallel, perpendicular, or neither.

16. $7x - 4y = 4$ $-4y = -7x + 4$ $-4y = -1x + 3$
 $x - 4y = 3$ $+4 \quad +4$ $+4 \quad +4$
 $y = \frac{7}{4}x - 1$ $y = \frac{1}{4}x - \frac{3}{4}$ neither

17. $y = -\frac{1}{2}x + 11$ $16x - 8y = -8$
 $-16x \quad -6x$
 $-8y = -16x - 8$ $y = 2x + 1$ perpendicular
 $\frac{-8y}{-8} = \frac{-16x-8}{-8}$ $m = -\frac{1}{2} \quad m = +\frac{2}{1}$

Write the equation of a line in point-slope form that is (a) parallel and (b) perpendicular to the given line and that passes through the given point.

18. $y = \frac{3}{5}x + 5; (9, -4)$
 (a) Parallel
 $y + 4 = \frac{3}{5}(x - 9)$

(b) Perpendicular
 $y + 4 = -\frac{5}{3}(x - 9)$

19. $x + 5y = 20; (-8, -7)$
 $x \quad y$
 $x + 5y = 20$ $m = -\frac{1}{5}$
 (a) Parallel
 $5y = -x + 20$
 $\frac{5y}{5} = \frac{-x+20}{5}$
 $y = -\frac{1}{5}x + 4$

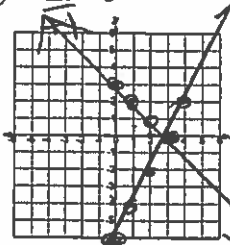
(b) Perpendicular $m = +5 = 5$
 $y + 7 = 5(x + 8)$

20. Solve the below system of linear equations by graphing.

$y = -1x + 3$

$y = 2x - 6$

$m = -\frac{1}{+1}$



$(3, 0)$

21. Solve the below system of linear equations by graphing.

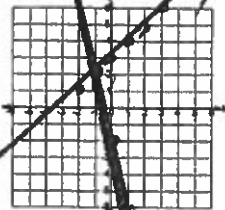
$-x + y = 3$

$4x + y = -2$

$y = 1x + 3$

$y = -4x - 2$

Solution: $(-1, 2)$



22. Solve the following system of inequalities by graphing.

$x + y < 3$

$-2x + 4y \geq 0$

$y < -1x + 3$

$\frac{4y}{4} \geq \frac{2x+0}{4}$

$y \geq \frac{1}{2}x + 0$

