NAME _____ DATE _____ PERIOD _____

Chapter 3 Test, Form 1

SCORE _____

Write the letter for the correct answer in the blank at the right of each question.

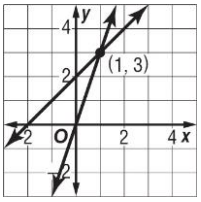
1. A system of linear equations may not have
A exactly one solution. **C** infinitely many solutions.
B no solution. **D** exactly two solutions. **1.** _____

Choose the correct description of each system of equations.
F consistent and independent **H** consistent and dependent
G inconsistent **J** inconsistent and dependent **2.** _____

2. $4x - 2y = -6$
$2x - y = 8$

3. $3x + y = 3$
$x - 2y = 4$ **3.** _____

4. Which system of equations is graphed



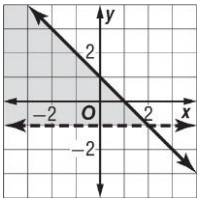
A $y - \frac{1}{3}x = 0$
$x - y = -2$

C $y - 3x = 0$
$x - y = 2$

B $y - 3x = 0$
$x - y = -2$

D $y - \frac{1}{3}x = 0$
$x - y = 2$ **4.** _____

5. Which system of inequalities is graphed?



F $y > -1$
$y \geq -x + 1$

H $y > -1$
$y \leq -x + 1$

G $y \geq -1$
$y \geq -x + 1$

J $y > -1$
$y < -x + 1$ **5.** _____

Use the system of inequalities $y \geq 0$, $x \geq 0$, and $y \leq -2x + 4$.

6. Find the coordinates of the vertices of the feasible region.
A (0, 0), (–2, 0), (0, –4) **C** (0, 0), (4, 0), (0, 2)
B (0, 0), (2, 0), (0, 4) **D** (0, 0), (–4, 0), (0, 2) **6.** _____

7. Find the minimum value of $f(x, y) = 3x + y$ for the feasible region.
F 6 **G** 4 **H** 2 **J** 0 **7.** _____

8. Find the maximum value of $f(x, y) = 3x + y$ for the feasible region.
A 2 **B** 4 **C** 6 **D** 12 **8.** _____

9. What is the value of y in the solution of the system of equations?

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

F –10 **G** –8 **H** 2 **J** 5 **9.** _____

10. The 300 students at Holmes School work a total of 5000 hours each month. Each student in group A works 10 hours, each in group B works 15 hours, and each in group C works 20 hours each month. There are twice as many students in group B as in group A. Which equation would *not* be included in the system used to solve this problem?
A $A = 2B$ **C** $A + B + C = 300$
B $10A + 15B + 20C = 5000$ **D** $B = 2A$ **10.** _____

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Chapter 3 Test, Form 1 *(continued)*

For Questions 11-15, use the matrices to find the following.

$P = \begin{bmatrix} 4 & 1 \\ 2 & 0 \end{bmatrix}$ $Q = \begin{bmatrix} 1 & 6 \\ 0 & 2 \end{bmatrix}$ $R = \begin{bmatrix} 0 & \frac{1}{2} \\ 1 & -2 \end{bmatrix}$ $S = \begin{bmatrix} 6 & -4 & 9 \\ 3 & -1 & -5 \end{bmatrix}$

11. the first row of 4*S*
F [–2 8 –5] **G** [12 –4 –20] **H** [24 –16 36] **J** not possible **11.** _____

12. the first row of 2*P* + 2*R*
A [8 3] **B** [4 3] **C** [6 –4] **D** not possible **12.** _____

13. the first row of *SP*
F [12 –4 –20] **G** [–23 21] **H** [53 –27] **J** not possible **13.** _____

14. the inverse of matrix *R*
A *P* **B** *Q* **C** *T* **D** not possible **14.** _____

15. the determinant of *Q*
F 8 **G** 4 **H** 2 **J** –2 **15.** _____

16. Find the value of $\begin{vmatrix} 5 & 1 \\ 3 & 2 \end{vmatrix}$.
A 13 **B** 7 **C** 17 **D** 3 **16.** _____

17. Which expression is true for all matrices $X_{2\times2}$, $Y_{2\times2}$, and scalars *c*?
F $c(X + Y) = (Y + X)c$ **H** $XY = YX$
G $c(XY) = (YX)c$ **J** $c(XY) = c(X)\ c(Y)$ **17.** _____

18. Evaluate $\begin{vmatrix} 2 & 0 & 1 \\ 3 & 1 & 2 \\ 1 & -2 & 5 \end{vmatrix}$ using diagonals.
A –2 **B** 7 **C** 11 **D** –1 **18.** _____

19. Cramer's Rule is used to solve the system of equations $2m + 3n = 11$ and $3m – 5n = 6$. Which determinant represents the numerator for *m*?
F $\begin{vmatrix} 11 & 2 \\ 6 & 3 \end{vmatrix}$ **G** $\begin{vmatrix} 2 & 3 \\ 3 & -5 \end{vmatrix}$ **H** $\begin{vmatrix} 2 & 11 \\ 3 & 6 \end{vmatrix}$ **J** $\begin{vmatrix} 11 & 3 \\ 6 & -5 \end{vmatrix}$ **19.** _____

20. Which product would be used to solve the matrix equation $\begin{bmatrix} 4 & 6 \\ 0 & 1 \end{bmatrix} \cdot \begin{bmatrix} m \\ n \end{bmatrix} = \begin{bmatrix} 4 \\ 0 \end{bmatrix}$ by using inverse matrices?
A $\begin{bmatrix} 4 & 6 \\ 0 & 1 \end{bmatrix} \cdot \begin{bmatrix} 4 \\ 0 \end{bmatrix}$ **B** $\frac{1}{4}\begin{bmatrix} 1 & -6 \\ 0 & 4 \end{bmatrix} \cdot \begin{bmatrix} 4 \\ 0 \end{bmatrix}$ **C** $\frac{1}{4}\begin{bmatrix} 4 & 6 \\ 0 & 1 \end{bmatrix} \cdot \begin{bmatrix} 4 \\ 0 \end{bmatrix}$ **D** $4\begin{bmatrix} 1 & -6 \\ 0 & 4 \end{bmatrix} \cdot \begin{bmatrix} 4 \\ 0 \end{bmatrix}$ **20.** _____

Bonus Find the value of $\begin{vmatrix} 0 & 1 & 0 \\ a & b & c \\ c & a & b \end{vmatrix}$. **B:** _____