

Chapter Standardized Test

TEST-TAKING STRATEGY If you find yourself spending too much time on one test question and getting frustrated, move on to the next question. You can revisit a difficult problem later with a fresh perspective.

1. **MULTIPLE CHOICE** Which ordered pair is a solution of the following system of linear equations?

$$\begin{aligned} 2x - 5y &= -12 \\ -x + 4y &= 9 \end{aligned}$$

- (A) $(-6, 0)$ (B) $(3, 3)$ (C) $(-1, 2)$
(D) $(-9, 0)$ (E) $(2, 2)$

2. **MULTIPLE CHOICE** How many solutions does the following system have?

$$\begin{aligned} 8x - 4y &= 20 \\ 2x - y &= 5 \end{aligned}$$

- (A) 0 (B) 1 (C) 2
(D) 4 (E) infinitely many

3. **MULTIPLE CHOICE** A total of \$6500 is invested in two funds. One fund pays 4% interest annually and the other fund pays 6% interest annually. The combined annual interest earned is \$350. How much of the \$6500 is invested in one of the funds?

- (A) \$2000 (B) \$2500 (C) \$3250
(D) \$4000 (E) \$5500

4. **MULTIPLE CHOICE** Which ordered pair is *not* a solution of the following system of linear inequalities?

$$\begin{aligned} x &\geq -2 \\ y &\geq -3 \\ y &< 3x + 3 \end{aligned}$$

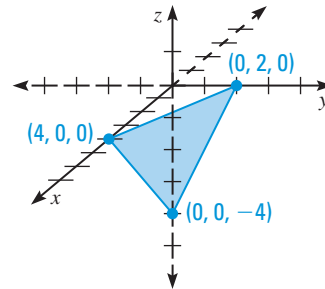
- (A) $(4, -3)$ (B) $(0, 0)$ (C) $(1, 6)$
(D) $(5, 17)$ (E) $(-1, -1)$

5. **MULTIPLE CHOICE** What is the minimum value of the objective function $C = 4x + 3y$ subject to the following constraints?

$$\begin{aligned} x &\geq 0 \\ y &\geq 0 \\ 2x + 3y &\leq 18 \\ 3x + y &\geq 6 \end{aligned}$$

- (A) 0 (B) 2 (C) 8
(D) 18 (E) 36

6. **MULTIPLE CHOICE** Which linear equation is graphed below?



- (A) $x - 2y - z = 4$ (B) $x - 2y + z = -4$
(C) $x + 2y - z = -4$ (D) $x + 2y - z = 4$
(E) $-x + 2y + z = 4$

7. **MULTIPLE CHOICE** At which point does the graph of $15x - 6y - 3z = 30$ cross the y-axis?

- (A) $(0, -6, 0)$ (B) $(2, 0, 0)$
(C) $(0, -3, 0)$ (D) $(0, 0, -10)$
(E) $(0, -5, 0)$

8. **MULTIPLE CHOICE** Which ordered triple is a solution of the following linear system?

$$\begin{aligned} 2x + 5y + 3z &= 10 \\ 3x - y + 4z &= 8 \\ 5x - 2y + 7z &= 12 \end{aligned}$$

- (A) $(7, 1, -3)$ (B) $(7, -1, -3)$
(C) $(7, 1, 3)$ (D) $(7, -1, 3)$
(E) $(-7, 1, -3)$

9. **MULTIPLE CHOICE** A cashier at a restaurant made the chart below for popular lunch combinations. What is the individual price of soup?

Lunch Combinations	
Soup + Salad	= \$4.25
Soup + Sandwich	= \$4.75
Salad + Sandwich	= \$5.50

- (A) \$1.50 (B) \$1.75 (C) \$2.25
(D) \$2.50 (E) \$3.00

QUANTITATIVE COMPARISON In Exercises 10 and 11, choose the statement that is true about the given quantities.

- (A) The quantity in column A is greater.
- (B) The quantity in column B is greater.
- (C) The two quantities are equal.
- (D) The relationship cannot be determined from the given information.

	Column A	Column B
10.	$f(x, y) = \frac{1}{5}(20 - 2x + y), f(4, 8)$	$f(x, y) = \frac{1}{5}(20 - 2x + y), f(-1, 3)$
11.	$f(x, y) = \frac{1}{2}(10 + 4x - 3y), f(-2, -1)$	$f(x, y) = \frac{1}{2}(10 + 4x - 3y), f(2, 1)$

12. **MULTI-STEP PROBLEM** Use the following system of linear equations.

$$\begin{array}{ll} x - 2y = 2 & \text{Equation 1} \\ 5x - 4y = -8 & \text{Equation 2} \end{array}$$

- a. Solve the system by graphing.
 - b. Solve the system using the substitution method. Show your work.
 - c. Solve the system using the linear combination method. Show your work.
 - d. *Writing* Which method do you prefer for solving this system? Explain.
13. **MULTI-STEP PROBLEM** Write an equation which, when paired with $-2x + 3y = 12$ to form a system, has the given number of solutions.
- a. exactly one solution
 - b. no solution
 - c. infinitely many solutions
 - d. *Writing* Explain how you wrote each of the equations in parts (a)–(c).
14. **MULTI-STEP PROBLEM** The cholesterol in your blood is necessary, but too much cholesterol can lead to health problems. A blood cholesterol test gives three readings: LDL “bad” cholesterol, HDL “good” cholesterol, and total cholesterol (LDL + HDL). It is recommended that your LDL cholesterol be less than 130 milligrams per deciliter, HDL cholesterol be at least 35 milligrams per deciliter, and total cholesterol be no more than 200 milligrams per deciliter.
- a. Write a system of three linear inequalities for the recommended cholesterol readings. Let x represent HDL cholesterol and y represent LDL cholesterol.
 - b. Graph the system. Label any vertices of the solution region.
 - c. Are the cholesterol readings at the right within recommendations?
 - d. Give an example of blood cholesterol test results in which the LDL cholesterol is too high, but HDL and total cholesterol readings are fine. Write a system of linear inequalities to describe all the examples of this type.
 - e. Another recommendation is that the ratio of total cholesterol to HDL cholesterol be less than 4. Find a point in your solution region from part (b) that meets this recommendation and show that it does.

LDL: 120 mg/dL
HDL: 90 mg/dL
Total: 210 mg/dL