CUMULATIVE ASSESSMENT, CHAPTERS 1–2

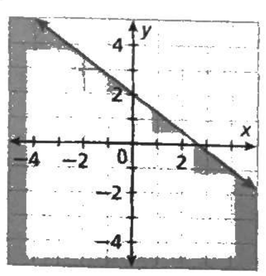
Multiple Choice

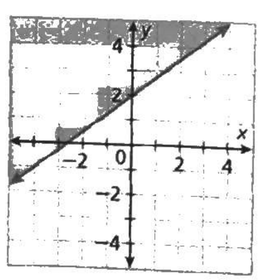
1. For which function is $g(-3) > g(5)$?
   - (A) $g(x) = 5x - 9$
   - (B) $g(x) = x^2 - 12$
   - (C) $g(x) = (x + 5)^2$
   - (D) $g(x) = (x - 9)^2$

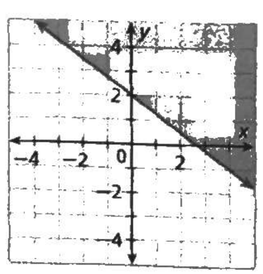
2. A television commercial claims that 4 out of every 5 dentists surveyed preferred Freshen toothpaste to the leading brand. If 120 dentists in the survey preferred Freshen, how many dentists participated in the survey?
   - (F) 30
   - (G) 96
   - (H) 150
   - (J) 180

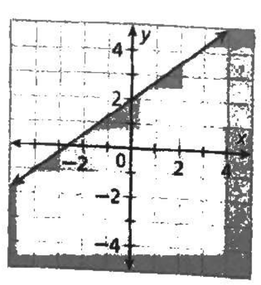
3. Which is an equation of a line with a slope of -3 that passes through $(-2, 7)$?
   - (A) $y = -3x - 1$
   - (B) $y = -3x + 1$
   - (C) $y = -3x + 13$
   - (D) $y = -\frac{1}{3}x + 1$

4. Which of the following shows the graph of $y + \frac{3}{4}x \geq 2$?

(F)


(H)


(G)


(J)


5. In which of the following number sets does -3 NOT belong?
   - (A) Integers
   - (B) Rational numbers
   - (C) Real numbers
   - (D) Whole numbers

6. What is a reasonable slope of the line of best fit of the salary data for teachers in a New York school district, as shown in the table below?

Salaries of Teachers

Years of Experience	Salary
0	$33,407
2	$34,273
5	$37,882
8	$40,185
10	$42,977
12	$45,864
15	$53,811

   - (F) 450
   - (G) 750
   - (H) 1275
   - (J) 2650

7. Which shows a reflection across the x-axis and a vertical translation of 3 units down of the parent function $y = |x|$?
   - (A) $y = -|x - 3|$
   - (B) $y = |x| - 3$
   - (C) $y = -|x| - 3$
   - (D) $y = |x - 3|$

8. Simplify the expression $4\sqrt{50} + 3\sqrt{72}$.
   - (F) $4\sqrt{7}$
   - (G) $7\sqrt{112}$
   - (H) $12\sqrt{5}$
   - (J) $38\sqrt{2}$

9. Find the slope of the line $-3y = 6x + 12$.
   - (A) -4
   - (B) -2
   - (C) $-\frac{1}{2}$
   - (D) $\frac{1}{}$

sketched close to scale.

10. A lamppost casts a shadow that is 24 feet long. Tad, who is 6 feet tall, is standing directly next to the lamppost. His shadow is 15 feet long. About how tall is the lamppost?
    - (F) 10 feet
    - (G) 15 feet
    - (H) 33 feet
    - (J) 60 feet

11. What is the effect on the graph of $y = 2x + 2$ when it is changed to $y = 2x - 2$?
    - (A) The slope of the line becomes steeper.
    - (B) The line slants down and right instead of up and right.
    - (C) The y-intercept is translated 4 units down.
    - (D) The line is reflected across the y-axis.

12. The cost of renting a moving van is $39.95 plus $0.40 per mile. Which equation best represents the relationship between cost c and the number of miles driven m?
    - (F) $c = 39.95 + 0.40$
    - (G) $c = 39.95m + 0.40$
    - (H) $c = 39.95 + 0.40m$
    - (J) $c = 39.95m + 0.40m$

Gridded Response

13. The baseball statistic "total bases" is calculated by adding the number of singles, twice the number of doubles, three times the number of triples, and four times the number of home runs. In 2001, a player collected 411 total bases, including 49 singles, 32 doubles and 2 triples. How many home runs did the player hit that year?

14. The function $g(x)$ is the reflection across the y-axis of $f(x) = -\frac{2}{3}x - 5$. What is the slope, to the nearest hundredth, of $g(x)$?

15. Evaluate $h^2 - hk + 2k^3 - 2$ for $h = 4$ and $k = -1$.

16.

Exercises

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GUIDED PRACTICE

1. **Vocabulary** Describe how to create a *matrix equation* from a system of equations.

1 Determine whether the given matrices are inverses.

2. $\begin{bmatrix} 8 & 4 \\ 2 & 1 \end{bmatrix}\begin{bmatrix} -\frac{1}{8} & \frac{3}{2} \\ \frac{1}{2} & -1 \end{bmatrix}$

3. $\begin{bmatrix} 1 & 0.4 & 1 \\ 1.2 & 0 & 0.8 \\ -1.6 & 0.2 & -1 \end{bmatrix}\begin{bmatrix} 3 & 12.5 & 2 \\ -1.6 & 2 & -1 \\ 5 & 1 & -10 \end{bmatrix}$

4. $\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}\begin{bmatrix} 1 & -1 \\ 0 & 1 \end{bmatrix}$

2 Find the inverse of the matrix, if it is defined.

5. $\begin{bmatrix} \frac{1}{2} & 0 \\ -\frac{1}{6} & \frac{1}{3} \end{bmatrix}$

6. $\begin{bmatrix} 1 & 7 \\ 2 & 6 \end{bmatrix}$

7. $\begin{bmatrix} \frac{1}{3} & 2 \\ \frac{3}{2} & 9 \end{bmatrix}$

8. $\begin{bmatrix} -1 & -1 \\ -1 & -1 \end{bmatrix}$

9. $\begin{bmatrix} 8 & 7 \\ 9 & 8 \end{bmatrix}$

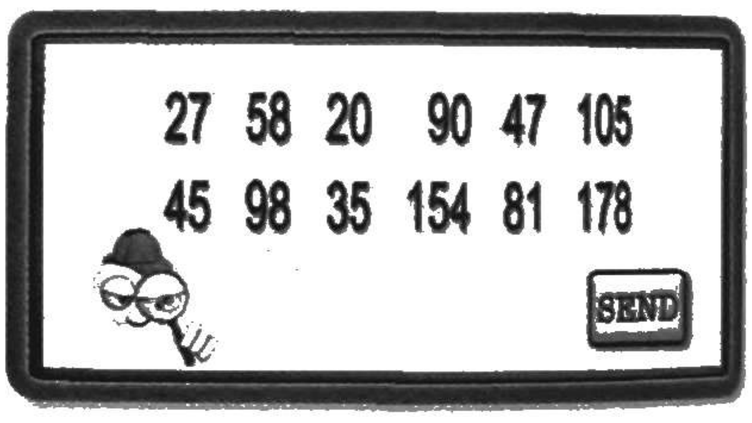
3 Write the matrix equation for the system, and solve.

10. $\begin{cases} 3x - y = 5 \\ y = 2x - 4 \end{cases}$

11. $\begin{cases} 5x + 9y = 1 \\ 2 - 4x - 7y = 4 \end{cases}$

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

4 13. **Cryptography** Rayanne receives the message shown, giving Sara's current location somewhere in Asia. The message was encoded using $\begin{bmatrix} 3 & 4 \\ 5 & 7 \end{bmatrix}$. Write the decoding matrix, and decode the message.



PRACTICE AND PROBLEM SOLVING

Determine whether the given matrices are inverses.

14. $\begin{bmatrix} 0 & 1 \\ 1 & 1 \end{bmatrix}\begin{bmatrix} 0 & 1 \\ 1 & -1 \end{bmatrix}$

15. $\begin{bmatrix} -1 & \frac{1}{2} \\ \frac{1}{4} & -2 \end{bmatrix}\begin{bmatrix} -\frac{16}{15} & -\frac{4}{15} \\ -\frac{2}{15} & -\frac{8}{15} \end{bmatrix}$

16. $\begin{bmatrix} 1 & 5 & -1 \\ 1 & 0 & -1 \\ 1 & 0 & 0 \end{bmatrix}\begin{bmatrix} 0 & 0 & 1 \\ 0.2 & -0.2 & 0 \\ 0 & -1 & 1 \end{bmatrix}$

Find the inverse of the matrix, if it is defined.

17. $\begin{bmatrix} -0.25 & -0.5 \\ -1.5 & -2 \end{bmatrix}$

18. $\begin{bmatrix} 7 & 14 \\ 3 & 6 \end{bmatrix}$

19. $\begin{bmatrix} 2 & 3 \\ 5 & 8 \end{bmatrix}$

20. $\begin{bmatrix} 5 & 4 \\ 4 & 3 \end{bmatrix}$

21. $\begin{bmatrix} -2 & -3 \\ 7 & 11 \end{bmatrix}$

Write the matrix equation for the system, and solve.

22. $\begin{cases} x - y = 5 \\ 2y - x = 6 \end{cases}$

23. $\begin{cases} x + 2y = 6 \\ 2x + y = 9 \end{cases}$

24. $\begin{cases} 4x + 7y = 10 \\ 3x + 5y = 9 \end{cases}$

25. **Cryptography** Quinn receives the coded message shown, which tells him when he needs to report to headquarters. It was encoded using the matrix $\begin{bmatrix} 7 & 3 \\ 9 & 4 \end{bmatrix}$. Write the decoding matrix, and decode the message. When will Quinn need to report?