

**CHAPTER 5** **Cumulative Test**  
**Form B**

Select the best answer.

- Simplify  $\frac{3\sqrt{3}}{\sqrt{6}} + \frac{5\sqrt{30}}{\sqrt{15}}$ .  
**A**  $\frac{13\sqrt{2}}{2}$                       **C**  $\frac{19}{2}\sqrt{2}$   
**B**  $8\sqrt{2}$                       **D** 160
- Simplify  $\left(\frac{6x^{-5}y^3}{5y^{-4}}\right)^2$ .  
**F**  $\frac{6}{5x^7y^2}$                       **H**  $\frac{36y^2}{25x^7}$   
**G**  $\frac{6y^2}{5x^7}$                       **J**  $\frac{36y^{14}}{25x^{10}}$
- Evaluate the expression  $\frac{36 \times 10^{-11}}{3 \times 10^7}$  and write the answer using scientific notation.  
**A**  $12 \times 10^{-18}$   
**B**  $1.2 \times 10^{-17}$   
**C**  $1.2 \times 10^{-16}$   
**D**  $12 \times 10^{-17}$
- What is the range of the relation shown in the table?

Number of Letters in the Names of Animals					
Animal	Ant	Gecko	Amoeba	Gnu	Parakeet
Number	3	5	6	3	8

- F** {Ant, Gecko, Amoeba, Gnu, Parakeet}  
**G** {3, 5, 6, 8}  
**H** {3, 5, 6, 3, 8}  
**J** natural numbers
- Evaluate  $f(x) = x^2 + 2x - 1$  for  $f(-3)$ .  
**A**  $f(-3) = -18$               **C**  $f(-3) = 2$   
**B**  $f(-3) = -1$                 **D**  $f(-3) = 14$

- Which function represents the length of a rectangular prism if the width is twice the height,  $h$ , and the volume of the prism is  $150 \text{ ft}^2$ ?

**F**  $L(h) = \frac{150}{h^3}$                       **H**  $L(h) = \frac{h^3}{150}$   
**G**  $L(h) = \frac{150}{2h^2}$                       **J**  $L(h) = \frac{h^2}{150}$

- The points  $\{(2, 32), (8, -10), (14, -16)\}$  are on the graph of function  $f$ . What are the coordinates of these three points after a vertical stretch by a factor of 6?

- A**  $\{(2, -150), (8, -402), (14, -438)\}$   
**B**  $\{(2, -24), (8, -276), (14, -312)\}$   
**C**  $\{(2, 192), (8, -60), (14, -96)\}$   
**D**  $\{(2, 282), (8, 30), (14, -6)\}$

- Which parent function best approximates this data set?

<b>x</b>	-10	-5	0	2	5
<b>y</b>	10	-3.125	-5	-5.12	-6.875

- F**  $f(x) = x$                       **H**  $f(x) = x^3$   
**G**  $f(x) = x^2$                       **J**  $f(x) = c$

- Data gathered about the growth of a population in hundreds is represented in the graph. Use the function that best approximates the data to predict the population in year 12.

<b>x</b>	0	3	5	8	9
<b>y</b>	50	48.95	47.75	45.2	44.15

- A** 3960                      **C** 4880  
**B** 4040                      **D** 5480
- Solve  $18.9x - 12.34 = 6.38 - 4.5x$ .  
**F**  $x = -13.2$                       **H**  $x = 0.8$   
**G**  $x = 0.68$                       **J**  $x = 9.75$

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11.  $\triangle ABC$  and  $\triangle DEF$  are similar. The longest side of  $\triangle ABC$  measures 9.36 cm and the longest side of  $\triangle DEF$  measures 5.2 cm. If the shortest side of  $\triangle ABC$  measures 3.8 cm, what does the shortest side of  $\triangle DEF$  measure?

- A** 6.56 cm                      **C** 7.96 cm  
**B** 6.84 cm                      **D** 12.81 cm

12. What is the  $y$ -intercept of the line  $\frac{2}{3}x - \frac{1}{4}y = 2$ ?

- F** (0, -8)                      **H** (0, 2)  
**G** (0, -3)                      **J** (0, 24)

13. Which is the equation of the line parallel to  $y = \frac{5}{8}x - 4$  and passing through (24, 27)?

- A**  $y = -\frac{8}{5}x + \frac{327}{5}$               **C**  $y = \frac{5}{8}x + 7\frac{1}{8}$   
**B**  $y = -\frac{8}{5}x + \frac{57}{5}$               **D**  $y = \frac{5}{8}x + 12$

14. Peppers at a farm stand cost \$3.50 per pound and artichokes cost \$4.50 per pound. If a shopper buys 1.5 pounds of peppers, how many pounds of artichokes can the shopper buy and spend less than \$18?

- F** between 0 and 2.8 pounds  
**G** between 2 and 2.9 pounds  
**H** between 3.5 and 4.5 pounds  
**J** greater than 2.9 pounds

15. If  $g(x)$  is a vertical compression of  $f(x) = -8x + 12$  by a factor of  $\frac{3}{2}$  followed by a horizontal translation of 7 units to the left and a shift of 18 units down, what is the rule for  $g(x)$ ?

- A**  $g(x) = -12x + 5$   
**B**  $g(x) = -12(x + 7) - 6$   
**C**  $g(x) = -\frac{16}{3}(x + 7) - 6$   
**D**  $g(x) = -\frac{16}{3}(x - 7) - 6$

16. Which equation best fits this data set?

<b>x</b>	-1	1	2	4	6
<b>y</b>	-13	-3	2	12	22

- F**  $y = \frac{1}{5}x + 8$                       **H**  $y = 5x - 8$   
**G**  $y = \frac{1}{5}x + 1\frac{3}{5}$                       **J**  $y = 5x - 12$

17. Solve  $\frac{|7x - 1|}{32} \geq 2$ .

- A**  $x \leq -9$  or  $x \geq \frac{65}{7}$   
**B**  $-9 \leq x \leq \frac{65}{7}$   
**C**  $x \geq -9$   
**D**  $x \geq \frac{65}{7}$

18. If  $g(x)$  is a vertical stretch by a factor of 4 of  $f(x) = |x - 1| + 2$ , followed by a horizontal translation 3 units to the left, and then a shift down by 5 units, what is the vertex of  $g(x)$ ?

- F** (-4, 3)                      **H** (2, -3)  
**G** (-2, -3)                      **J** (4, -3)

19. Use substitution to determine which ordered pair is the solution of the system of equations  $\begin{cases} y = 3x + 10 \\ x + 2y = 6 \end{cases}$ .

- A**  $(-\frac{4}{7}, \frac{58}{7})$                       **C**  $(-\frac{7}{3}, 3)$   
**B** (-2, 4)                      **D** (2, 2)

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20. The system  $\begin{cases} 3x - 12y = 150 \\ 4y + 50 = x \end{cases}$  is
- F** inconsistent, with no solution.
- G** inconsistent, with infinitely many solutions.
- H** consistent, with no solution.
- J** consistent, with infinitely many solutions.
21. The Krazy Karnival Amusement Park charges a \$30 entrance fee, plus a charge of \$2.50 per ride ticket. The Happy Fun Time Amusement Park charges an \$18 entrance fee, plus \$4 per ride ticket. For what number of tickets is the total cost of the entrance fee and ride tickets the same for both parks?

- A** 0 tickets                      **C** 8 tickets
- B** 1 ticket                        **D** 10 tickets

22. Solve  $\begin{cases} x - 4y = 16 \\ 2x - 3y = 2 \end{cases}$  using substitution.
- F**  $(-8, -6)$                       **H**  $(5, 1)$
- G**  $(-\frac{16}{3}, -7)$                       **J**  $(6, -\frac{18}{7})$

23. Solve  $\begin{cases} 5x + 6y = -36 \\ 3x - 2y = 40 \end{cases}$  using elimination.
- A**  $(\frac{2}{7}, \frac{137}{7})$                       **C**  $(6, -11)$
- B**  $(\frac{1}{2}, 1)$                         **D**  $(9\frac{1}{2}, -5\frac{3}{4})$

24. Classify the figure created by the solution region of the system of

$$\text{inequalities } \begin{cases} x \geq -4 \\ y \leq 0 \\ y \geq \frac{5}{3}x - 3 \\ 5x + 6 \geq 3y \\ 3x + 5y \leq -5 \end{cases}$$

- F** quadrilateral
- G** kite
- H** trapezoid
- J** isosceles trapezoid

25. Given the constraints  $\begin{cases} x \geq 0 \\ x \leq 8 \\ y \geq 0 \\ x + 3y \leq 21 \\ 3x + 2y \leq 28 \end{cases}$ ,

what is the maximum of the objective function  $R = 2x + 12y$ ?

- A** 78 at  $(3, 6)$
- B** 80 at  $(6, 6)$
- C** 82 at  $(7, 6)$
- D** 40 at  $(8, 2)$

26. Which point is the  $x$ -intercept of the plane  $15x - 23y + 330z = 2310$ ?

- F**  $(0, 0, 7)$
- G**  $(0, 0, 154)$
- H**  $(154, 0, 0)$
- J**  $(154, -10, 7)$

27. Use elimination to solve

$$\begin{cases} 8x + 2y - 4z = 5 \\ 4x + y - z = -2 \\ -6x + y + 4z = 10 \end{cases}$$

- A**  $(-3.45, 7.3, -4.5)$
- B**  $(-1.05, 5.7, -0.5)$
- C**  $(\frac{7}{3}, \frac{7}{2}, 14)$
- D**  $(1.8, 5.7, 5.2)$

28. The table shows the number of phone calls two students made each month. Which matrix displays the data in the table?

Number of Phone Calls to Friends per Month				
Student	September	October	November	December
Sam	8	3	6	5
Elise	3	5	4	7

- F**  $\begin{bmatrix} 5 & 6 & 3 & 8 \\ 7 & 4 & 5 & 3 \end{bmatrix}$                       **H**  $\begin{bmatrix} 8 & 3 & 6 & 5 \\ 7 & 4 & 5 & 3 \end{bmatrix}$
- G**  $\begin{bmatrix} 8 & 3 & 6 & 5 \\ 3 & 5 & 4 & 7 \end{bmatrix}$                       **J**  $\begin{bmatrix} 7 & 4 & 5 \\ 5 & 6 & 3 \end{bmatrix}$

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29. If  $A = \begin{bmatrix} 1 & -2 \\ 7 & 0 \\ -5 & 4 \end{bmatrix}$  and  $B = \begin{bmatrix} 12 & -9 \\ -4 & -10 \\ 7 & 8 \end{bmatrix}$ ,

evaluate  $2A - 3B$ .

**A**  $\begin{bmatrix} -38 & 26 \\ 16 & 30 \\ -22 & -16 \end{bmatrix}$       **C**  $\begin{bmatrix} -10 & 5 \\ 18 & 10 \\ -17 & 0 \end{bmatrix}$

**B**  $\begin{bmatrix} -34 & 23 \\ 26 & 30 \\ -31 & -16 \end{bmatrix}$       **D**  $\begin{bmatrix} 38 & -31 \\ 2 & -30 \\ 11 & 32 \end{bmatrix}$

30. For  $M_{3 \times 5}$  and  $N_{5 \times 2}$ , what are the dimensions of  $MN$ ?

**F**  $3 \times 2$       **H**  $3 \times 5$

**G**  $3 \times 3$       **J**  $5 \times 5$

31. If  $A = \begin{bmatrix} 2 & 9 \\ -5 & 1 \\ 0 & 8 \end{bmatrix}$  and  $B = \begin{bmatrix} -1 & 4 \\ 10 & -3 \end{bmatrix}$ ,

evaluate  $AB$ .

**A**  $\begin{bmatrix} -2 & 50 & 0 \\ 36 & -3 & 8 \end{bmatrix}$

**B**  $\begin{bmatrix} -2 & 36 \\ -50 & -3 \\ 0 & 8 \end{bmatrix}$

**C**  $\begin{bmatrix} 88 & 15 & 80 \\ -19 & -23 & -24 \end{bmatrix}$

**D**  $\begin{bmatrix} 88 & -19 \\ 15 & -23 \\ 80 & -24 \end{bmatrix}$

32.  $\triangle ABC$  has vertices  $A(5, 2)$ ,  $B(7, -15)$ , and  $C(-3, 8)$ . What are the coordinates of the image of  $\triangle ABC$  after it has been rotated using the rotation matrix

$$\begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}?$$

**F**  $A'(-5, 2)$ ,  $B'(-7, -15)$ ,  $C'(3, 8)$

**G**  $A'(-3, -8)$ ,  $B'(7, 15)$ ,  $C'(5, -2)$

**H**  $A'(-2, 5)$ ,  $B'(15, 7)$ ,  $C'(-8, -3)$

**J**  $A'(2, -5)$ ,  $B'(-15, -7)$ ,  $C'(8, 3)$

33. Find the determinant of  $\begin{bmatrix} 8 & -1 & -4 \\ -6 & 3 & -18 \\ -1 & 0 & 7 \end{bmatrix}$ .

**A**  $-52$

**C**  $236$

**B**  $96$

**D**  $304$

34. What are the solutions of the system

$$\begin{cases} f_1x + g_1y = h_1 \\ f_2x + g_2y = h_2 \end{cases}, \text{ where } D = \begin{vmatrix} f_1 & g_1 \\ f_2 & g_2 \end{vmatrix}?$$

**F**  $x = \frac{\begin{vmatrix} f_1 & g_1 \\ f_2 & g_2 \end{vmatrix}}{D}, y = \frac{\begin{vmatrix} h_1 & g_1 \\ h_2 & g_2 \end{vmatrix}}{D}$

**G**  $x = \frac{\begin{vmatrix} g_1 & h_1 \\ g_2 & h_2 \end{vmatrix}}{D}, y = \frac{\begin{vmatrix} h_1 & f_1 \\ h_2 & f_2 \end{vmatrix}}{D}$

**H**  $x = \frac{\begin{vmatrix} h_2 & g_2 \\ h_1 & g_1 \end{vmatrix}}{D}, y = \frac{\begin{vmatrix} f_2 & h_2 \\ f_1 & h_1 \end{vmatrix}}{D}$

**J**  $x = \frac{\begin{vmatrix} h_1 & g_1 \\ h_2 & g_2 \end{vmatrix}}{D}, y = \frac{\begin{vmatrix} f_1 & h_1 \\ f_2 & h_2 \end{vmatrix}}{D}$

35. Which matrix is the inverse of  $\begin{bmatrix} -2 & 4 \\ -1 & 3 \end{bmatrix}$ ?

**A**  $-\frac{1}{2} \begin{bmatrix} -2 & 4 \\ -1 & 3 \end{bmatrix}$

**C**  $-\frac{1}{2} \begin{bmatrix} 3 & 4 \\ 1 & 2 \end{bmatrix}$

**B**  $-\frac{1}{2} \begin{bmatrix} 2 & -1 \\ 4 & -3 \end{bmatrix}$

**D**  $\frac{1}{2} \begin{bmatrix} 3 & 4 \\ 1 & 2 \end{bmatrix}$

## Answer Key continued

13. One real solution
14.  $x \leq -9$  or  $x \geq \frac{1}{2}$
15.  $-1 < x < \frac{2}{3}$
16.  $f(x) = -2x^2 + 13x - 5$
17. 1.25 seconds
18.  $2i + 1$
19.  $-3\frac{1}{2} - \frac{27}{5}i$
20.  $5\sqrt{2}$

### Chapter Test Form C

1. Horizontal stretch by 8, no horizontal translation, 9 units down
2.  $f(x) = \frac{2}{5}(x - 8)^2 + 3$
3.  $(-4.6, -72.9)$ ;  $(0, -20)$
4. minimum at  $(-15, -27.5)$
5.  $x = -\frac{7}{3}$  or  $x = \frac{1}{4}$
6.  $\frac{14\sqrt{29}}{87}$
7.  $f(x) = 12x^2 - 23x - 24$
8.  $(-\frac{1}{10}, -\frac{2}{7})$
9.  $f(x) = (x - \frac{3}{8})^2 + \frac{55}{64}$
10.  $-\frac{\sqrt{66}}{13}$
11.  $x = \frac{4\sqrt{7}}{7}i$
12.  $-\frac{3}{5} \pm 17i$
13. Two complex solutions
14.  $-\frac{3}{4} \leq x \leq \frac{1}{14}$
15.  $x \leq \frac{\sqrt{5}}{3}$  or  $x \geq \frac{\sqrt{5}}{2}$
16.  $-\frac{13}{60}x^2 - \frac{47\sqrt{5}}{60}x + 8$
17. 2.75 seconds
18.  $\frac{3 + 35i}{1234}$
19.  $4 + 4\sqrt{2} + 7i + 7i\sqrt{2}$
20. 61

### Performance Assessment

1.  $D^2 = \frac{13}{9}x^2 + \frac{52}{9}x + \frac{169}{9}$

2.  $(-2, 3)$
3. It is the point on the line that is closest to the origin.
4.  $-\frac{3}{2}$
5. The point on a line that is closest to the origin lies on a line passing through the origin that is perpendicular to the original line.

### Cumulative Test

1. A
2. J
3. D
4. G
5. C
6. G
7. D
8. H
9. B
10. H
11. B
12. F
13. D
14. G
15. B
16. H
17. A
18. G
19. B
20. J
21. C
22. F
23. C
24. J

- 25. A
- 26. H
- 27. A
- 28. G
- 29. B
- 30. F
- 31. D
- 32. H
- 33. B
- 34. J
- 35. C

**CHAPTER 6**

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**Section Quiz: Section A**

- 1. A
- 2. G
- 3. D
- 4. G
- 5. D
- 6. G
- 7. C
- 8. H
- 9. A
- 10. G
- 11. C

**Section Quiz: Section B**

- 1. B
- 2. G
- 3. C
- 4. H
- 5. B
- 6. J
- 7. A

- 8. H
- 9. B
- 10. C

**Chapter Test Form A**

- 1. C
- 2. A
- 3. C
- 4. B
- 5. D
- 6. A
- 7. A
- 8. B
- 9. C
- 10. A
- 11. A
- 12. A
- 13. B
- 14. B
- 15. B
- 16. A
- 17. B
- 18. B
- 19. B
- 20. C

**Chapter Test Form B**

- 1. C
- 2. J
- 3. D
- 4. F
- 5. C
- 6. G
- 7. B