Chapter Standardized Test

▶ **TEST-TAKING STRATEGY** Before you give up on a question, try to eliminate some of your choices so you can make an educated guess.

1. MULTIPLE CHOICE Which one of the following is *not* a quadratic equation?

A $x^2 - 4 = 0$ **B** $x^2 + 10x + 21 = 0$

C $-9 + x^2 = 0$ **D** $-7x + 12 = 0$

E $-2 + 9x + x^2 = 0$

**2. MULTIPLE CHOICE** Which one of the following is a solution of the equation $\frac{2}{3}t^2 - 7 = 17$?

A -6 **B** -4 **C** 4

D $\sqrt{15}$ **E** $\sqrt{24}$

3. MULTIPLE CHOICE You drop a rock from a bridge 320 feet above a river. How long will it take the rock to hit the river?

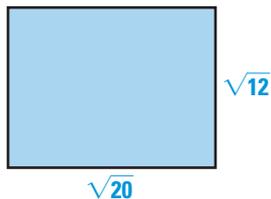**A** 2.5 sec   **B** 3.5 sec   **C** 3.8 sec

D 4.5 sec   **E** 5.5 sec

4. MULTIPLE CHOICE The surface area S of a cube is 150 square feet. What is the length (in feet) of each edge of the cube? $\left(S = 6s^2\right)$

A ±5

B $5\sqrt{6}$

C 5

D 25

E None of these
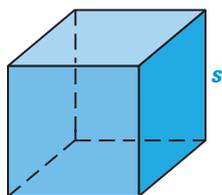
5. MULTIPLE CHOICE Find the area of the rectangle.

A $20\sqrt{3}$

B 240

C 60

D $12\sqrt{5}$

E $4\sqrt{15}$

$\sqrt{12}$
$\sqrt{20}$

6. MULTIPLE CHOICE What is the value of x when $3x^2 - 78 = 114$?

A $\pm2\sqrt{3}$ **B** $\pm4\sqrt{3}$ **C** ±6

D ±8 **E** $\pm2\sqrt{29}$

QUANTITATIVE COMPARISON In Questions 7 and 8, perform the indicated operation and simplify the result. Then choose the statement below that is true about the given numbers.

A The number in column A is greater.

B The number in column B is greater.

C The two numbers are equal.

D The relationship cannot be determined from the given information.

	Column A	Column B
7.	$\sqrt{24} \cdot \sqrt{6}$	$\sqrt{25} \cdot \sqrt{5}$
8.	$\dfrac{\sqrt{27}\sqrt{3}}{\sqrt{9}}$	$\dfrac{\sqrt{30}\sqrt{6}}{\sqrt{12}}$

9. MULTIPLE CHOICE What is the x-coordinate of the vertex for the graph of the equation $y = -\frac{1}{2}x^2 - x + 8$?

A -2 **B** -1 **C** $-\frac{1}{2}$

D $\frac{1}{2}$ **E** 1

10. MULTIPLE CHOICE What are the x-intercepts of the graph of $y = -x^2 - 6x + 40$?

A 4 and 10   **B** -7 and 1

C -10 and 4   **D** -8 and 2

E -11 and 5

11. MULTIPLE CHOICE Which one of the following is a solution of $-3x^2 + 22x + 93 = 0$?

A -7 **B** 3 **C** $-\frac{6}{31}$

D -3 **E** $\frac{31}{6}$

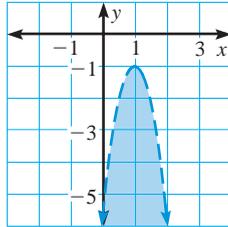**12. MULTIPLE CHOICE** Which one of the following is a solution of $4x^2 - 17x + 13 = 0$?

A $-\frac{17}{13}$ **B** -1 **C** $\frac{4}{13}$

D 13 **E** 1

13. MULTIPLE CHOICE What is the discriminant of the equation $-7x^2 - 2x + 5 = 0$?

    (A) 12   **(B)** 144   **(C)** -12 **(D)** 136   **(E)** 1
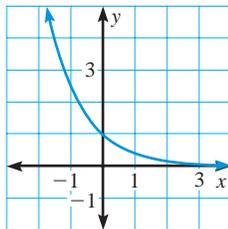
14. MULTIPLE CHOICE Which of the following inequalities is represented by the graph?

    (A) $y > -4x^2 + 8x - 5$

    (B) $y < 4x^2 + 8x - 5$

    (C) $y > 4x^2 + 8x - 5$

    (D) $y \le -4x^2 + 8x - 5$

    (E) $y < -4x^2 + 8x - 5$

15. MULTIPLE CHOICE Name the type of model suggested by the graph.

    (A) Quadratic

    (B) Exponential decay

    (C) Exponential growth

    (D) Linear

    (E) None of these

16. MULTI-STEP PROBLEM Use the data in the table below.

x	−5	−4	−2	0	1	2
y	0.3	0.5	1.5	5	9	16.2

    a. Make a scatter plot of the data.

    b. Name the type of model that best fits the data.

    c. Write a model that best fits the data.

17. MULTI-STEP PROBLEM A bird flying above the edge of a cliff sees a fish several meters below the surface of the water in a lake bounded by the cliff. The bird makes a dive to catch the fish. The path of the dive follows a parabolic curve given by the function $y = x^2 - 12x + 32$. At the right is a graph of this function. Imagine that the x-axis runs along the surface of the lake and that the y-axis runs along the edge of the cliff.

    a. How far from the side of the cliff is the fish if it is at the vertex of the curve?

    b. How far below the surface of the water does the bird have to dive to catch the fish?

    c. How far from the side of the cliff will the bird enter and exit the water (x-intercepts)?

    d. Approximate the height of the cliff (y-intercept).

    e. *Writing* If the bird enters the water 4 meters from the side of the cliff and exits it 8 meters from the cliff, write an inequality to represent the region in which the fish can swim safely.

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