Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. Which of the following is a square root of 196?
   A. 98
   B. -14
   C. 392
   D. 16

2. Between what two consecutive whole numbers does $\sqrt{31}$ lie?
   A. 4 and 5
   B. 6 and 7
   C. 5 and 6
   D. 7 and 8

3. Subtract. $15\sqrt{5} - 17\sqrt{5}$
   A. $32\sqrt{10}$
   B. $32\sqrt{5}$
   C. $-2\sqrt{5}$
   D. -2

4. Find the square root. $\sqrt{64}$
   A. -8
   B. 32
   C. 8
   D. 4096

5. Evaluate $-3\sqrt{20} - \sqrt{5}$
   A. $-\sqrt{5}$
   B. $-7\sqrt{5}$
   C. $-3\sqrt{15}$
   D. already simplified

6. Find the perimeter of a triangle whose side lengths are 15 cm, $8\sqrt{7}$ cm, and $\sqrt{112}$ cm. Give the answer as a radical expression in simplest form.
   A. $(15 + 8\sqrt{7} + \sqrt{112})$ cm
   B. $(15 + 12\sqrt{7})$ cm
   C. $(15 + 24\sqrt{7})$ cm
   D. $27\sqrt{7}$ cm

7. Simplify the expression $\sqrt{8y} + 5\sqrt{50y} - 2\sqrt{18y}$.
   A. $13\sqrt{2y}$
   B. $21\sqrt{2y}$
   C. $\left(\sqrt{8} + 5\sqrt{50} - 2\sqrt{18}\right)\sqrt{y}$
   D. $882y$

8. Simplify the expression $\sqrt{125d} + 5\sqrt{20d} - 3\sqrt{45d}$.
   A. $180d$
   B. $12\sqrt{5d}$
   C. $6\sqrt{5d}$
   D. $\left(\sqrt{125} + 5\sqrt{20} - 3\sqrt{45}\right)\sqrt{d}$

9. Simplify the expression $\sqrt{18x} + 4\sqrt{8x} - \sqrt{50x}$.
   A. $13\sqrt{2x}$
   B. $6\sqrt{2x}$
   C. $72x$
   D. $\left(\sqrt{18} + 4\sqrt{8} - \sqrt{50}\right)\sqrt{x}$

10. Simplify the expression $\sqrt{45b} + 4\sqrt{20b} - 2\sqrt{125b}$.
    A. $\sqrt{5b}$
    B. $12\sqrt{5b}$
    C. $5b$
    D. $\left(\sqrt{45} + 4\sqrt{20} - 2\sqrt{125}\right)\sqrt{b}$

11. Multiply. Write the product in simplest form.

    $\sqrt{2}\left(\sqrt{6} + \sqrt{7}\right)$

    A. $\sqrt{12} + \sqrt{14}$

B. $2\sqrt{6} + 2\sqrt{7}$
C. $\sqrt{26}$
D. $2\sqrt{3} + \sqrt{14}$

12. Multiply. Write the product in simplest form.

$\sqrt{9}\left(\sqrt{3} + \sqrt{8}\right)$

A. $9\sqrt{3} + 18\sqrt{2}$
B. $3\sqrt{11}$
C. $\sqrt{27} + \sqrt{72}$
D. $3\sqrt{3} + 6\sqrt{2}$

13. The area of a square garden is 173 square feet. Estimate the side length of the garden.

A. 16 ft
B. 11 ft
C. 15 ft
D. 13 ft

14. The area of a square garden is 85 square meters. Estimate the side length of the garden.

A. 9 m
B. 7 m
C. 11 m
D. 12 m

15. Simplify $\sqrt{\frac{200}{49}}$.

A. $\frac{20}{7}$
B. $\frac{2}{7}$
C. $\frac{10\sqrt{2}}{7}$
D. $\frac{2\sqrt{10}}{7}$

16. Simplify $\sqrt{\frac{363}{49}}$.

A. $\frac{3}{7}$
B. $\frac{3\sqrt{11}}{7}$
C. $\frac{11\sqrt{3}}{7}$
D. $\frac{33}{7}$

17. Between what two consecutive whole numbers does $\sqrt{230}$ lie?

A. 13 and 14
B. 14 and 15
C. 15 and 16
D. 199 and 201

18. Multiply. Write the product in simplest form.

$\sqrt{6x}\sqrt{9x}$

A. $18x$
B. $\left(9x\sqrt{6}\right)$
C. $\left(3x\sqrt{6}\right)$
D. $\left(x\sqrt{54}\right)$

19. Multiply. Write the product in simplest form.

$\sqrt{21b}\sqrt{35b}$

A. $\left(b\sqrt{735}\right)$
B. $\left(49b\sqrt{15}\right)$
C. $\left(7b\sqrt{15}\right)$
D. $105b$

20. Simplify the quotient $\frac{\sqrt{6}}{\sqrt{13}}$.

A. $\frac{6}{\sqrt{78}}$

B. $\frac{6}{13}$

C. $\frac{\sqrt{6}}{13}$

D. $\frac{\sqrt{78}}{13}$

21. Simplify the quotient $\frac{\sqrt{7}}{\sqrt{3}}$.

A. $\frac{7}{\sqrt{21}}$

B. $\frac{\sqrt{21}}{3}$

C. $\frac{\sqrt{7}}{3}$

D. $\frac{7}{3}$

22. A square stepping stone in Atlanta's Centennial Olympic Park measure $4\sqrt{2}$ feet on a side. Which of the following is TRUE of the area of the square stone?

A. The area is a perfect square
B. The area is a rational number
C. The area is an irrational number
D. The area cannot be determined

23. Simplify the expression $\sqrt{4a^3b^2}$. All variables represent nonnegative numbers.

A. $2ab\sqrt{a}$

B. $2ab\sqrt{a^2}$

C. $2\sqrt{a^2}$

D. $2a^2b^2\sqrt{a}$

24. Simplify the expression $\sqrt{16r^2s^5}$. All variables represent nonnegative numbers.

A. $4rs^2\sqrt{s}$

B. $4\sqrt{s^2}$

C. $4r^2s^4\sqrt{s}$

D. $4rs^2\sqrt{s^2}$

25. Write all classifications that apply to the real number $\frac{\sqrt{16}}{2}$.

A. real, irrational number, terminating decimal, integer, whole number, natural number
B. real, rational number, terminating decimal, integer, whole number, natural number
C. real, rational number, terminating decimal, whole number
D. real, irrational number

26. Write all classifications that apply to the real number $\frac{\sqrt{100}}{5}$.

A. real, irrational number, terminating decimal, integer, whole number, natural number
B. real, rational number, terminating decimal, whole number
C. real, rational number, terminating decimal, integer, whole number, natural number
D. real, irrational number

Answer Section

MULTIPLE CHOICE

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

SHORT ANSWER

27. 44 feet
(11 x 11 square
so perimeter = 11+11+11+11 = 44 feet)

28. $5\sqrt{3}$

29. $-\frac{6}{5}$

30. $9\sqrt{2}+10$