

Simplifying Radicals 2

Multiple Choice

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

- _____ 1. Find the square root.
 $\sqrt{49}$
a. 24.5
b. 7
c. 2401
d. -7
- _____ 2. The area of a square garden is 199 square meters. Estimate the side length of the garden.
a. 12 m
b. 16 m
c. 14 m
d. 17 m
- _____ 3. Simplify the expression $\sqrt{27}$.
a. $3\sqrt{3}$
b. $\sqrt{9}$
c. $9\sqrt{3}$
d. $3\sqrt{9}$
- _____ 4. Simplify the expression $\sqrt{108}$.
a. $36\sqrt{3}$
b. $6\sqrt{3}$
c. $\sqrt{18}$
d. $6\sqrt{18}$
- _____ 5. Simplify the expression $\sqrt{a^2b^5}$. All variables represent nonnegative numbers.
a. $ab^2\sqrt{b}$
b. $\sqrt{b^2}$
c. $a^2b^4\sqrt{b}$
d. $ab^2\sqrt{b^2}$
- _____ 6. Simplify the expression $\sqrt{16r^5s^2}$. All variables represent nonnegative numbers.
a. $4\sqrt{r^2}$
b. $4r^2s\sqrt{r}$
c. $4r^4s^2\sqrt{r}$
d. $4r^2s\sqrt{r^2}$
- _____ 7. Simplify the expression $\sqrt{192}$.
a. $8\sqrt{3}$
b. $\sqrt{24}$
c. $8\sqrt{24}$
d. $64\sqrt{3}$
- _____ 8. Simplify the expression $\sqrt{4x^5y^4}$. All variables represent nonnegative numbers.
a. $2x^4y^4\sqrt{x}$
b. $2x^2y^2\sqrt{x^2}$
c. $2x^2y^2\sqrt{x}$
d. $2\sqrt{x^2}$

Simplify the expression.

- _____ 9. $(-1 + 6i) + (-4 + 2i)$
a. $5 - 8i$
b. $5 - 2i$
c. $-5 + 8i$
d. $3i$

- _____ 10. $(2 - 5i) - (3 + 4i)$
 a. $1 + 9i$ c. $-1 - 9i$
 b. $5 - i$ d. $-10i$
- _____ 11. $(-6i)(-6i)$
 a. 36 b. -36 c. $-36i$ d. $36i$
- _____ 12. $(2 + 5i)(-1 + 5i)$
 a. $-27 + 5i$ c. $-2 + 25i$
 b. $23 + 5i$ d. $-2 + 5i$
- _____ 13. $(5 + 3i)(1 + 2i)$
 a. $5 + 13i$ c. $-1 + 13i$
 b. $11 + 13i$ d. $5 + 6i$

Multiply and simplify if possible.

- _____ 14. $\sqrt{7x}(\sqrt{x} - 7\sqrt{7})$
 a. $x\sqrt{7} - 49\sqrt{x}$ c. $x\sqrt{7} - x\sqrt{49}$
 b. $\sqrt{7x} - 49x$ d. $-\sqrt{42x}$
- _____ 15. Simplify $\sqrt[3]{128a^{13}b^6}$. Assume that all variables are positive.
 a. $4a^4b^2\sqrt[3]{2a}$ c. $4a^4b^3\sqrt[3]{a}$
 b. $2a^4b^2\sqrt[3]{4a}$ d. none of these

Rationalize the denominator of the expression. Assume that all variables are positive.

- _____ 16. $\frac{\sqrt{3} - \sqrt{6}}{\sqrt{3} + \sqrt{6}}$
 a. $\frac{-1 - 2\sqrt{18}}{3}$ c. $-3 + 2\sqrt{2}$
 b. $\frac{-3 - 2\sqrt{18}}{9}$ d. $9 - 2\sqrt{18}$

Add if possible.

- _____ 17. $2^4\sqrt{2x} + 6^4\sqrt{2x}$
 a. $8^4\sqrt{4x}$ c. $8^4\sqrt{2x}$
 b. $16^4\sqrt{2x}$ d. not possible to simplify
- _____ 18. $4^3\sqrt{3x} + 5^3\sqrt{10x}$
 a. $9^3\sqrt{13x}$ c. $27^3\sqrt{10x}$
 b. $27^3\sqrt{3x}$ d. not possible to simplify

Subtract if possible.

____ 19. $2^4\sqrt{5a} - 6^4\sqrt{5a}$

a. $-20^4\sqrt{5a}$

b. $8^4\sqrt{5a}$

c. $-4^4\sqrt{5a}$

d. not possible to simplify

____ 20. $4\sqrt{3} - 3\sqrt{4}$

a. $4\sqrt{3} - 6$

b. $\sqrt{7}$

c. 1

d. not possible to simplify

Simplify.

____ 21. $-\sqrt{5} - 3\sqrt{36} + 6\sqrt{5}$

a. $5\sqrt{5} - 18$

b. $5\sqrt{5} - 3\sqrt{36}$

c. $-5\sqrt{5} - 18$

d. none of these

____ 22. $-\sqrt{5} - 6\sqrt{4} - 4\sqrt{5}$

a. $-5\sqrt{5} - 12$

b. $-5\sqrt{5} - 6\sqrt{4}$

c. $5\sqrt{5} - 12$

d. none of these

____ 23. $-\sqrt{5} - 4\sqrt{25} + 6\sqrt{5}$

a. $5\sqrt{5} - 20$

b. $5\sqrt{5} - 4\sqrt{25}$

c. $-5\sqrt{5} - 20$

d. none of these

____ 24. $-\sqrt{6} - 2\sqrt{9} + 5\sqrt{6}$

a. $4\sqrt{6} - 6$

b. $4\sqrt{6} - 2\sqrt{9}$

c. $-4\sqrt{6} - 6$

d. none of these

Simplifying Radicals 2
Answer Section

MULTIPLE CHOICE

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

Simplifying Radicals 2

Multiple Choice

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

_____ 1. Simplify the expression $\sqrt{12}$.

a. $4\sqrt{3}$

b. $2\sqrt{3}$

c. $\sqrt{6}$

d. $2\sqrt{6}$

Simplify the expression.

_____ 2. $(-3 + 3i)(-1 - 2i)$

a. $-3 + 3i$

b. $9 + 3i$

c. $3 + 3i$

d. $3 - 6i$

_____ 3. $(-6 - 3i) + (1 + i)$

a. $-5 - 2i$

b. $-7i$

c. $-9 + 2i$

d. $5 + 2i$

_____ 4. $(-6 + 2i)(-2 + 4i)$

a. $12 - 28i$

b. $20 - 28i$

c. $4 - 28i$

d. $12 + 8i$

_____ 5. $(-i)(7i)$

a. $7i$

b. -7

c. 7

d. $-7i$

_____ 6. $(1 + 6i) - (5 - 6i)$

a. $4 - 12i$

b. $8i$

c. $6 + 0i$

d. $-4 + 12i$

_____ 7. Simplify the expression $\sqrt{9w^3z^3}$. All variables represent nonnegative numbers.

a. $3w^2z^2\sqrt{wz}$

b. $3wz\sqrt{wz}$

c. $3wz\sqrt{w^2z^2}$

d. $3\sqrt{w^2z^2}$

_____ 8. Simplify the expression $\sqrt{w^2z^5}$. All variables represent nonnegative numbers.

a. $\sqrt{z^2}$

b. $w^2z^4\sqrt{z}$

c. $wz^2\sqrt{z}$

d. $wz^2\sqrt{z^2}$

Rationalize the denominator of the expression. Assume that all variables are positive.

_____ 9. $\frac{\sqrt{3} - \sqrt{6}}{\sqrt{3} + \sqrt{6}}$

a. $9 - 2\sqrt{18}$

b. $-3 + 2\sqrt{2}$

c. $\frac{-1 - 2\sqrt{18}}{3}$

d. $\frac{-3 - 2\sqrt{18}}{9}$

Simplify.

_____ 10. $-\sqrt{3} + 2\sqrt{16} - 5\sqrt{3}$

a. $-6\sqrt{3} + 2\sqrt{16}$

b. $-6\sqrt{3} + 8$

c. $6\sqrt{3} + 8$

d. none of these

_____ 11. $-\sqrt{7} + 4\sqrt{25} + 5\sqrt{7}$

a. $-4\sqrt{7} + 20$

b. $4\sqrt{7} + 4\sqrt{25}$

c. $4\sqrt{7} + 20$

d. none of these

_____ 12. $-\sqrt{2} + 6\sqrt{16} + 5\sqrt{2}$

a. $4\sqrt{2} + 6\sqrt{16}$

b. $-4\sqrt{2} + 24$

c. $4\sqrt{2} + 24$

d. none of these

_____ 13. $-\sqrt{10} + 4\sqrt{4} + 5\sqrt{10}$

a. $-4\sqrt{10} + 8$

b. $4\sqrt{10} + 8$

c. $4\sqrt{10} + 4\sqrt{4}$

d. none of these

Multiply and simplify if possible.

_____ 14. $\sqrt{7x}(\sqrt{x} - 7\sqrt{7})$

a. $\sqrt{7x} - 49x$

b. $x\sqrt{7} - 49\sqrt{x}$

c. $x\sqrt{7} - x\sqrt{49}$

d. $-\sqrt{42x}$

Add if possible.

_____ 15. $2^3\sqrt{2x} + 5^3\sqrt{7x}$

a. $7^3\sqrt{9x}$

b. $14^3\sqrt{7x}$

c. $14^3\sqrt{2x}$

d. not possible to simplify

_____ 16. $2^3\sqrt{7x} + 6^3\sqrt{7x}$

a. $56^3\sqrt{7x}$

b. $8^3\sqrt{14x}$

c. $8^3\sqrt{7x}$

d. not possible to simplify

- _____ 17. Simplify the expression $\sqrt{4c^2d^3}$. All variables represent nonnegative numbers.
 a. $2cd\sqrt{d^2}$ c. $2cd\sqrt{d}$
 b. $2\sqrt{d^2}$ d. $2c^2d^2\sqrt{d}$
- _____ 18. Simplify the expression $\sqrt{16x^2y^5}$. All variables represent nonnegative numbers.
 a. $4x^2y^4\sqrt{y}$ c. $4xy^2\sqrt{y^2}$
 b. $4\sqrt{y^2}$ d. $4xy^2\sqrt{y}$
- _____ 19. Find the square root.
 $-\sqrt{9}$
 a. 3 c. 81
 b. -3 d. -4.5

Subtract if possible.

- _____ 20. $6\sqrt{10a} - 5\sqrt{10a}$
 a. $10\sqrt{10a}$ c. $11\sqrt{10a}$
 b. $\sqrt{10a}$ d. not possible to simplify
- _____ 21. $4\sqrt{3} - 3\sqrt{4}$
 a. 1 c. $4\sqrt{3} - 6$
 b. $\sqrt{7}$ d. not possible to simplify
- _____ 22. The area of a square garden is 174 square meters. Estimate the side length of the garden.
 a. 13 m c. 16 m
 b. 11 m d. 15 m
- _____ 23. Simplify $\sqrt[3]{108a^{16}b^{15}}$. Assume that all variables are positive.
 a. $3a^5b^3\sqrt[3]{a}$ c. $3a^5b^5\sqrt[3]{4a}$
 b. $4a^5b^5\sqrt[3]{3a}$ d. none of these
- _____ 24. Simplify the expression $\sqrt{16r^4s^3}$. All variables represent nonnegative numbers.
 a. $4r^2s\sqrt{s^2}$ c. $4\sqrt{s^2}$
 b. $4r^4s^2\sqrt{s}$ d. $4r^2s\sqrt{s}$

Simplifying Radicals 2
Answer Section

MULTIPLE CHOICE

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

Simplifying Radicals 2

Multiple Choice

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

- _____ 1. Simplify the expression $\sqrt{r^4 s^3}$. All variables represent nonnegative numbers.
 a. $r^4 s^2 \sqrt{s}$ c. $r^2 s \sqrt{s}$
 b. $r^2 s \sqrt{s^2}$ d. $\sqrt{s^2}$
- _____ 2. Simplify the expression $\sqrt{4w^2 z^5}$. All variables represent nonnegative numbers.
 a. $2\sqrt{z^2}$ c. $2w z^2 \sqrt{z^2}$
 b. $2w^2 z^4 \sqrt{z}$ d. $2w z^2 \sqrt{z}$
- _____ 3. Simplify the expression $\sqrt{24}$.
 a. $\sqrt{12}$ c. $2\sqrt{6}$
 b. $4\sqrt{6}$ d. $2\sqrt{12}$

Simplify the expression.

- _____ 4. $(4i)(-i)$
 a. 4 b. $-4i$ c. $4i$ d. -4
- _____ 5. $(5 - 6i)(-4 - 4i)$
 a. $-44 + 4i$ c. $-20 + 24i$
 b. $4 + 4i$ d. $-20 + 4i$
- _____ 6. $(2 - i) - (1 + 4i)$
 a. $3 + 3i$ c. $-1 + 5i$
 b. $-4i$ d. $1 - 5i$
- _____ 7. $(-2 + 6i)(-4 + 2i)$
 a. $8 + 12i$ c. $8 - 28i$
 b. $-4 - 28i$ d. $20 - 28i$
- _____ 8. $(1 + i) + (-6 - 5i)$
 a. $-5 - 4i$ c. $5 + 4i$
 b. $-9i$ d. $2 - 11i$

Subtract if possible.

- _____ 9. $2\sqrt{10a} - 4\sqrt{10a}$
 a. $-20\sqrt{10a}$ c. $-2\sqrt{10a}$
 b. $6\sqrt{10a}$ d. not possible to simplify
- _____ 10. $4\sqrt{3} - 3\sqrt{4}$
 a. 1 c. $4\sqrt{3} - 6$
 b. $\sqrt{7}$ d. not possible to simplify

Multiply and simplify if possible.

- ___ 11. $\sqrt{7x}(\sqrt{x} - 7\sqrt{7})$
- a. $x\sqrt{7} - 49\sqrt{x}$ c. $-\sqrt{42x}$
b. $\sqrt{7x} - 49x$ d. $x\sqrt{7} - x\sqrt{49}$

Add if possible.

- ___ 12. $5^4\sqrt{6x} + 5^4\sqrt{6x}$
- a. $60^4\sqrt{6x}$ c. $10^4\sqrt{6x}$
b. $10^4\sqrt{12x}$ d. not possible to simplify
- ___ 13. $2\sqrt{3x} + 5\sqrt{6x}$
- a. $7\sqrt{9x}$ c. $21\sqrt{3x}$
b. $21\sqrt{6x}$ d. not possible to simplify
- ___ 14. Simplify the expression $\sqrt{4c^4d^5}$. All variables represent nonnegative numbers.
- a. $2c^2d^2\sqrt{d}$ c. $2c^4d^4\sqrt{d}$
b. $2c^2d^2\sqrt{d^2}$ d. $2\sqrt{d^2}$

Rationalize the denominator of the expression. Assume that all variables are positive.

- ___ 15. $\frac{\sqrt{3} - \sqrt{6}}{\sqrt{3} + \sqrt{6}}$
- a. $-3 + 2\sqrt{2}$ c. $\frac{-1 - 2\sqrt{18}}{3}$
b. $\frac{-3 - 2\sqrt{18}}{9}$ d. $9 - 2\sqrt{18}$
- ___ 16. Simplify $\sqrt[3]{54a^{16}b^6}$. Assume that all variables are positive.
- a. $3a^5b^2\sqrt[3]{2a}$ c. $2a^5b^2\sqrt[3]{3a}$
b. $3a^5b^3\sqrt[3]{a}$ d. none of these

Simplify.

- ___ 17. $-\sqrt{10} - 5\sqrt{36} - 2\sqrt{10}$
- a. $3\sqrt{10} - 30$ c. $-3\sqrt{10} - 30$
b. $-3\sqrt{10} - 5\sqrt{36}$ d. none of these
- ___ 18. $-\sqrt{5} + 6\sqrt{4} - 4\sqrt{5}$
- a. $5\sqrt{5} + 12$ c. $-5\sqrt{5} + 6\sqrt{4}$
b. $-5\sqrt{5} + 12$ d. none of these

- _____ 19. $-\sqrt{7} + 3\sqrt{9} - 5\sqrt{7}$
a. $-6\sqrt{7} + 9$ c. $6\sqrt{7} + 9$
b. $-6\sqrt{7} + 3\sqrt{9}$ d. none of these
- _____ 20. $-\sqrt{5} - 3\sqrt{36} - 6\sqrt{5}$
a. $-7\sqrt{5} - 3\sqrt{36}$ c. $7\sqrt{5} - 18$
b. $-7\sqrt{5} - 18$ d. none of these
- _____ 21. Simplify the expression $\sqrt{4x^2y^5}$. All variables represent nonnegative numbers.
a. $2xy^2\sqrt{y^2}$ c. $2xy^2\sqrt{y}$
b. $2x^2y^4\sqrt{y}$ d. $2\sqrt{y^2}$
- _____ 22. The area of a square garden is 231 square feet. Estimate the side length of the garden.
a. 13 ft c. 15 ft
b. 17 ft d. 18 ft
- _____ 23. Find the square root.
 $\sqrt{36}$
a. -6 c. 1296
b. 6 d. 18
- _____ 24. Simplify the expression $\sqrt{54}$.
a. $3\sqrt{6}$ c. $\sqrt{18}$
b. $3\sqrt{18}$ d. $9\sqrt{6}$

Simplifying Radicals 2
Answer Section

MULTIPLE CHOICE

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