

## Simplifying Radicals

### Multiple Choice

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

- \_\_\_\_\_ 1. Find the square root.  
 $\sqrt{196}$   
a. 14  
b. 98  
c. 38416  
d. -14
- \_\_\_\_\_ 2. The area of a square garden is 202 square feet. Estimate the side length of the garden.  
a. 16 ft  
b. 12 ft  
c. 17 ft  
d. 14 ft
- \_\_\_\_\_ 3. Simplify the expression  $\sqrt{16r^4s^5}$ . All variables represent nonnegative numbers.  
a.  $4\sqrt{s^2}$   
b.  $4r^2s^2\sqrt{s^2}$   
c.  $4r^2s^2\sqrt{s}$   
d.  $4r^4s^4\sqrt{s}$
- \_\_\_\_\_ 4. Simplify  $\sqrt{\frac{z^{11}}{81z}}$ . The variable represents a nonnegative number.  
a.  $\frac{\sqrt{z^{10}}}{9}$   
b.  $\frac{z^5}{9}$   
c.  $\frac{z^{10}}{81}$   
d.  $\sqrt{\frac{z^5}{9}}$
- \_\_\_\_\_ 5. Simplify  $\sqrt{\frac{300}{49}}$ .  
a.  $\frac{3\sqrt{10}}{7}$   
b.  $\frac{3}{7}$   
c.  $\frac{10\sqrt{3}}{7}$   
d.  $\frac{30}{7}$
- \_\_\_\_\_ 6. Subtract.  
 $3\sqrt{3} - 15\sqrt{3}$   
a.  $-12\sqrt{3}$   
b.  $18\sqrt{6}$   
c.  $18\sqrt{3}$   
d. -12
- \_\_\_\_\_ 7. Simplify the expression  $\sqrt{20d} + 4\sqrt{125d} - 3\sqrt{45d}$ .  
a.  $845d$   
b.  $11\sqrt{5d}$   
c.  $(\sqrt{20} + 4\sqrt{125} - 3\sqrt{45})\sqrt{d}$   
d.  $13\sqrt{5d}$
- \_\_\_\_\_ 8. Find the perimeter of a triangle whose side lengths are 7 cm,  $5\sqrt{3}$  cm, and  $\sqrt{12}$  cm. Give the answer as a radical expression in simplest form.  
a.  $(7 + 5\sqrt{3} + \sqrt{12})$  cm  
b.  $(7 + 7\sqrt{3})$  cm  
c.  $(7 + 9\sqrt{3})$  cm  
d.  $14\sqrt{3}$  cm

\_\_\_\_\_ 9. Multiply. Write the product in simplest form.

$$\sqrt{10b} \sqrt{6b}$$

a.  $(4\sqrt{15})b$

c.  $(2\sqrt{15})b$

b.  $30b$

d.  $(\sqrt{60})b$

\_\_\_\_\_ 10. Multiply. Write the product in simplest form.

$$\sqrt{2}(\sqrt{8} + \sqrt{4})$$

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

c.  $\sqrt{16} + \sqrt{8}$

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

d.  $2\sqrt{6}$

\_\_\_\_\_ 11. Multiply  $(\sqrt{10} - 9)^2$ . Write the product in simplest form.

a.  $91 - 18\sqrt{10}$

c.  $73\sqrt{10}$

b.  $-71$

d.  $-71 - 18\sqrt{10}$

\_\_\_\_\_ 12. Simplify the quotient  $\frac{\sqrt{3}}{\sqrt{7}}$ .

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

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

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

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

\_\_\_\_\_ 13. Simplify  $\frac{9}{\sqrt{6} - \sqrt{5}}$ .

a.  $9\sqrt{6} + 9\sqrt{5}$

c.  $\frac{9\sqrt{6} + 9\sqrt{5}}{\sqrt{6} - \sqrt{5}}$

b.  $9$

d.  $9\sqrt{6} - 9\sqrt{5}$

**Simplify the radical expression.**

\_\_\_\_\_ 14.  $-4\sqrt{160}$

a.  $-4\sqrt{80}$

b.  $-4\sqrt{16}$

c.  $-16\sqrt{10}$

d.  $\sqrt{10}$

\_\_\_\_\_ 15.  $\sqrt{144}$

a.  $12$

b.  $12\sqrt{2}$

c.  $6$

d.  $4\sqrt{6}$

\_\_\_\_\_ 16.  $-3\sqrt{180h^4}$

a.  $6\sqrt{5h^4}$

c.  $-18h^2\sqrt{5}$

b.  $-18\sqrt{5h^4}$

d.  $-3h\sqrt{90}$

\_\_\_\_\_ 17.  $-2\sqrt{2p} \cdot 2\sqrt{22}$

factor 1: 1  
 factpr 2: 11  
 common factor: 2

a.  $\sqrt{44p}$

b.  $-8\sqrt{11p}$

c.  $-4\sqrt{44p}$

d.  $-8\sqrt{11p^2}$

\_\_\_\_\_ 18.  $\sqrt{\frac{10}{81}}$

a.  $\frac{10}{9}$

b.  $\frac{\sqrt{10}}{41}$

c.  $9\sqrt{10}$

d.  $\frac{\sqrt{10}}{9}$

\_\_\_\_\_ 19.  $\sqrt{\frac{80w^3}{9}}$

a.  $\frac{w\sqrt{80w}}{3}$

b.  $\frac{4w\sqrt{5w}}{3}$

c.  $\frac{\sqrt{80w^3}}{3}$

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

\_\_\_\_\_ 20.  $\sqrt{\frac{400}{5}}$

a.  $4\sqrt{5}$

b.  $\frac{16\sqrt{5}}{5}$

c. 160

d.  $\frac{16\sqrt{5}}{\sqrt{5}}$

\_\_\_\_\_ 21.  $\sqrt{\frac{63x^{15}y^9}{7xy^{11}}}$

a.  $\frac{8x^7y^4\sqrt{xy}}{\sqrt{7xy^{11}}}$

b.  $\frac{3x^7}{y}$

c.  $\frac{9x^7}{y}$

d.  $9x^7y$

\_\_\_\_\_ 22.  $-2\sqrt{160}$

a.  $-2\sqrt{80}$

b.  $2\sqrt{10}$

c.  $-2\sqrt{16}$

d.  $-8\sqrt{10}$

\_\_\_\_\_ 23.  $-3\sqrt{50}$

a.  $2\sqrt{2}$

b.  $-15\sqrt{2}$

c.  $-3\sqrt{25}$

d.  $-3\sqrt{25}$

\_\_\_\_\_ 24.  $\sqrt{48}$

a.  $4\sqrt{3}$

b.  $\sqrt{16}$

c.  $5\sqrt{3}$

d.  $\sqrt{24}$

\_\_\_\_\_ 25.  $-4\sqrt{180}$

a.  $-4\sqrt{90}$

b.  $2\sqrt{5}$

c.  $-4\sqrt{36}$

d.  $-24\sqrt{5}$

\_\_\_\_\_ 26.  $-2\sqrt{32}$

a.  $-2\sqrt{16}$

b.  $2\sqrt{2}$

c.  $-8\sqrt{2}$

d.  $-2\sqrt{16}$

\_\_\_\_\_ 27.  $-3\sqrt{20}$

a.  $-\sqrt{5}$

b.  $-6\sqrt{5}$

c.  $-3\sqrt{10}$

d.  $-3\sqrt{4}$

Name: \_\_\_\_\_

ID: A

- \_\_\_\_\_ 28.  $-\sqrt{44}$   
a.  $-\sqrt{22}$       b.  $-2\sqrt{11}$       c.  $-\sqrt{4}$       d.  $\sqrt{11}$
- \_\_\_\_\_ 29.  $2\sqrt{44}$   
a.  $4\sqrt{11}$       b.  $4\sqrt{11}$       c.  $2\sqrt{4}$       d.  $2\sqrt{22}$
- \_\_\_\_\_ 30.  $-3\sqrt{48}$   
a.  $-12\sqrt{3}$       b.  $-3\sqrt{24}$       c.  $-3\sqrt{16}$       d.  $\sqrt{3}$
- \_\_\_\_\_ 31.  $-3\sqrt{75}$   
a.  $-3\sqrt{25}$       b.  $-15\sqrt{3}$       c.  $2\sqrt{3}$       d.  $-3\sqrt{37.5}$
- \_\_\_\_\_ 32.  $4\sqrt{72}$   
a.  $24\sqrt{2}$       b.  $4\sqrt{36}$       c.  $10\sqrt{2}$       d.  $4\sqrt{36}$
- \_\_\_\_\_ 33.  $-4\sqrt{8}$   
a.  $-2\sqrt{2}$       b.  $-4\sqrt{4}$       c.  $-8\sqrt{2}$       d.  $-4\sqrt{4}$
- \_\_\_\_\_ 34.  $4\sqrt{75}$   
a.  $4\sqrt{25}$       b.  $4\sqrt{37.5}$       c.  $9\sqrt{3}$       d.  $20\sqrt{3}$
- \_\_\_\_\_ 35.  $2\sqrt{180}$   
a.  $2\sqrt{90}$       b.  $12\sqrt{5}$       c.  $2\sqrt{36}$       d.  $8\sqrt{5}$
- \_\_\_\_\_ 36.  $-4\sqrt{125}$   
a.  $-20\sqrt{5}$       b.  $\sqrt{5}$       c.  $-4\sqrt{25}$       d.  $-4\sqrt{62.5}$
- \_\_\_\_\_ 37.  $2\sqrt{72}$   
a.  $12\sqrt{2}$       b.  $8\sqrt{2}$       c.  $2\sqrt{36}$       d.  $2\sqrt{36}$
- \_\_\_\_\_ 38.  $-\sqrt{48}$   
a.  $-\sqrt{16}$       b.  $-\sqrt{24}$       c.  $-4\sqrt{3}$       d.  $3\sqrt{3}$
- \_\_\_\_\_ 39.  $2\sqrt{80}$   
a.  $8\sqrt{5}$       b.  $2\sqrt{16}$       c.  $6\sqrt{5}$       d.  $2\sqrt{40}$
- \_\_\_\_\_ 40.  $-4\sqrt{360}$   
a.  $-4\sqrt{36}$       b.  $-24\sqrt{10}$       c.  $2\sqrt{10}$       d.  $-4\sqrt{180}$
- \_\_\_\_\_ 41.  $-2\sqrt{490}$   
a.  $-2\sqrt{49}$       b.  $5\sqrt{10}$       c.  $-14\sqrt{10}$       d.  $-2\sqrt{245}$
- \_\_\_\_\_ 42.  $2\sqrt{125}$   
a.  $7\sqrt{5}$       b.  $10\sqrt{5}$       c.  $2\sqrt{25}$       d.  $2\sqrt{62.5}$
- \_\_\_\_\_ 43.  $4\sqrt{180}$   
a.  $4\sqrt{36}$       b.  $24\sqrt{5}$       c.  $4\sqrt{90}$       d.  $10\sqrt{5}$
- \_\_\_\_\_ 44.  $\sqrt{160}$   
a.  $\sqrt{16}$       b.  $\sqrt{80}$       c.  $5\sqrt{10}$       d.  $4\sqrt{10}$

\_\_\_\_\_ 45.  $-3\sqrt{108}$   
a.  $-3\sqrt{36}$       b.  $3\sqrt{3}$       c.  $-3\sqrt{54}$       d.  $-18\sqrt{3}$

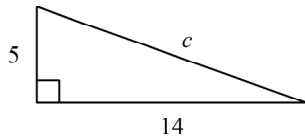
**Simplify the radical expression by rationalizing the denominator.**

\_\_\_\_\_ 46.  $\frac{4}{\sqrt{21}}$   
a.  $\frac{4\sqrt{21}}{21}$       b.  $4\sqrt{21}$       c.  $21\sqrt{4}$       d.  $\frac{\sqrt{441}}{21}$

\_\_\_\_\_ 47.  $\frac{7\sqrt{100}}{\sqrt{500}}$   
a.  $\frac{7}{\sqrt{400}}$       b.  $\frac{7\sqrt{5}}{5}$       c.  $\frac{7\sqrt{500}}{250}$       d.  $\frac{7\sqrt{500}}{500}$

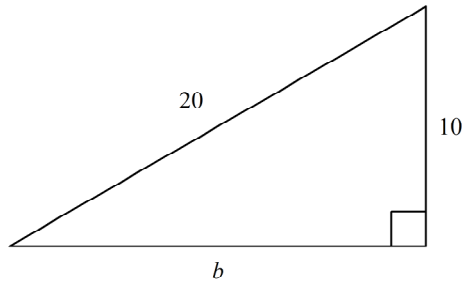
**Find the length of the missing side. If necessary, round to the nearest tenth.**

\_\_\_\_\_ 48.



a. 361      b. 19      c. 38      d. 14.9

\_\_\_ 49.



- a. 15                      b. 22.4                      c. 17.3                      d. 30

**Simplify the expression.**

- \_\_\_ 50.  $\sqrt{6} + 2\sqrt{6}$   
 a.  $3\sqrt{6}$                       b.  $-\sqrt{6}$                       c.  $3\sqrt{12}$                       d.  $-\sqrt{12}$
- \_\_\_ 51.  $4\sqrt{7} + 8\sqrt{63}$   
 a.  $76\sqrt{7}$                       b.  $12\sqrt{63}$                       c.  $28\sqrt{7}$                       d.  $28\sqrt{63}$
- \_\_\_ 52.  $(6 - \sqrt{11})(6 + \sqrt{11})$   
 a.  $36 + \sqrt{11}$                       c.  $-85$   
 b.  $47 + 12\sqrt{11}$                       d.  $25$
- \_\_\_ 53.  $\sqrt{39}(\sqrt{6} + 7)$   
 a.  $\sqrt{45} + 7\sqrt{39}$                       c.  $\sqrt{234} + 7$   
 b.  $3\sqrt{26} + 7\sqrt{39}$                       d.  $\sqrt{234} + 7\sqrt{39}$
- \_\_\_ 54.  $\frac{8}{\sqrt{6} - \sqrt{3}}$   
 a.  $\frac{8\sqrt{6} - 8\sqrt{3}}{3}$                       c.  $\frac{8\sqrt{6} + 8\sqrt{3}}{\sqrt{27}}$   
 b.  $\frac{8(\sqrt{6} + \sqrt{3})}{9}$                       d.  $\frac{8\sqrt{6} + 8\sqrt{3}}{3}$

- \_\_\_\_\_ 55.  $\frac{\sqrt{2} + \sqrt{6}}{\sqrt{8} + \sqrt{6}}$
- a.  $\frac{\sqrt{12} + 6 - \sqrt{16} - \sqrt{48}}{-2}$       c.  $\frac{\sqrt{8}}{\sqrt{14}}$
- b.  $\sqrt{3} - 1$       d.  $\frac{1}{\sqrt{4}} + 1$
- \_\_\_\_\_ 56.  $(7 + \sqrt{3})(7 - \sqrt{3})$
- a.  $49 + \sqrt{3}$       c.  $52 + 14\sqrt{3}$
- b. 40      d. 46
- \_\_\_\_\_ 57.  $(9 + \sqrt{6})(9 - \sqrt{6})$
- a.  $81 + \sqrt{6}$       c.  $87 + 18\sqrt{6}$
- b. 45      d. 75
- \_\_\_\_\_ 58.  $(6 + \sqrt{6})(6 - \sqrt{6})$
- a.  $36 + \sqrt{6}$       c. 0
- b.  $42 + 12\sqrt{6}$       d. 30
- \_\_\_\_\_ 59.  $(6 - \sqrt{3})(6 + \sqrt{3})$
- a.  $36 + \sqrt{3}$       c.  $39 + 12\sqrt{3}$
- b. 33      d. 27
- \_\_\_\_\_ 60.  $(8 - \sqrt{5})(8 + \sqrt{5})$
- a. 59      c.  $64 + \sqrt{5}$
- b. 39      d.  $69 + 16\sqrt{5}$
- \_\_\_\_\_ 61.  $(10 - \sqrt{10})(10 + \sqrt{10})$
- a.  $100 + \sqrt{10}$       c. 0
- b.  $110 + 20\sqrt{10}$       d. 90
- \_\_\_\_\_ 62.  $(2 - \sqrt{10})(2 + \sqrt{10})$
- a.  $4 + \sqrt{10}$       c. -6
- b.  $14 + 4\sqrt{10}$       d. -96
- \_\_\_\_\_ 63.  $(7 + \sqrt{10})(7 - \sqrt{10})$
- a.  $59 + 14\sqrt{10}$       c. -51
- b. 39      d.  $49 + \sqrt{10}$
- \_\_\_\_\_ 64.  $(3 + \sqrt{10})(3 - \sqrt{10})$
- a. -91      c.  $19 + 6\sqrt{10}$
- b.  $9 + \sqrt{10}$       d. -1
- \_\_\_\_\_ 65.  $(3 + \sqrt{6})(3 - \sqrt{6})$
- a. 3      c.  $15 + 6\sqrt{6}$
- b.  $9 + \sqrt{6}$       d. -27

- \_\_\_ 66.  $(6 - \sqrt{6})(6 + \sqrt{6})$   
a. 0  
b. 30  
c.  $42 + 12\sqrt{6}$   
d.  $36 + \sqrt{6}$
- \_\_\_ 67.  $(9 - \sqrt{7})(9 + \sqrt{7})$   
a.  $88 + 18\sqrt{7}$   
b.  $81 + \sqrt{7}$   
c. 74  
d. 32
- \_\_\_ 68.  $(9 + \sqrt{7})(9 - \sqrt{7})$   
a.  $81 + \sqrt{7}$   
b. 74  
c.  $88 + 18\sqrt{7}$   
d. 32
- \_\_\_ 69.  $(2 + \sqrt{7})(2 - \sqrt{7})$   
a. -3  
b.  $4 + \sqrt{7}$   
c.  $11 + 4\sqrt{7}$   
d. -45
- \_\_\_ 70.  $(2 - \sqrt{2})(2 + \sqrt{2})$   
a. 2  
b.  $4 + \sqrt{2}$   
c.  $6 + 4\sqrt{2}$   
d. 0
- \_\_\_ 71.  $(4 + \sqrt{2})(4 - \sqrt{2})$   
a. 14  
b.  $18 + 8\sqrt{2}$   
c. 12  
d.  $16 + \sqrt{2}$
- \_\_\_ 72.  $(2 + \sqrt{10})(2 - \sqrt{10})$   
a.  $4 + \sqrt{10}$   
b. -6  
c. -96  
d.  $14 + 4\sqrt{10}$
- \_\_\_ 73.  $(4 + \sqrt{11})(4 - \sqrt{11})$   
a.  $16 + \sqrt{11}$   
b. -105  
c. 5  
d.  $27 + 8\sqrt{11}$
- \_\_\_ 74.  $(4 + \sqrt{3})(4 - \sqrt{3})$   
a.  $16 + \sqrt{3}$   
b. 13  
c. 7  
d.  $19 + 8\sqrt{3}$
- \_\_\_ 75.  $(2 - \sqrt{7})(2 + \sqrt{7})$   
a. -45  
b.  $4 + \sqrt{7}$   
c.  $11 + 4\sqrt{7}$   
d. -3
- \_\_\_ 76.  $(8 + \sqrt{6})(8 - \sqrt{6})$   
a.  $64 + \sqrt{6}$   
b. 58  
c. 28  
d.  $70 + 16\sqrt{6}$
- \_\_\_ 77. Simplify the expression  $\sqrt{135}$ .  
a.  $9\sqrt{15}$   
b.  $3\sqrt{45}$   
c.  $\sqrt{45}$   
d.  $3\sqrt{15}$



- \_\_\_\_\_ 78. Simplify the expression  $\sqrt{48}$ .
- |                |                 |
|----------------|-----------------|
| a. $4\sqrt{3}$ | c. $4\sqrt{12}$ |
| b. $\sqrt{12}$ | d. $16\sqrt{3}$ |
- \_\_\_\_\_ 79. Simplify the expression  $\sqrt{9x^2y^5}$ . All variables represent nonnegative numbers.
- |                      |                      |
|----------------------|----------------------|
| a. $3xy^2\sqrt{y^2}$ | c. $3\sqrt{y^2}$     |
| b. $3xy^2\sqrt{y}$   | d. $3x^2y^4\sqrt{y}$ |
- \_\_\_\_\_ 80. Simplify the expression  $\sqrt{192}$ .
- |                 |                 |
|-----------------|-----------------|
| a. $8\sqrt{3}$  | c. $\sqrt{24}$  |
| b. $64\sqrt{3}$ | d. $8\sqrt{24}$ |
- \_\_\_\_\_ 81. Simplify the expression  $\sqrt{4r^4s^5}$ . All variables represent nonnegative numbers.
- |                        |                      |
|------------------------|----------------------|
| a. $2\sqrt{s^2}$       | c. $2r^4s^4\sqrt{s}$ |
| b. $2r^2s^2\sqrt{s^2}$ | d. $2r^2s^2\sqrt{s}$ |
- \_\_\_\_\_ 82. Simplify the expression  $\sqrt{60}$ .
- |                 |                 |
|-----------------|-----------------|
| a. $4\sqrt{15}$ | c. $2\sqrt{30}$ |
| b. $2\sqrt{15}$ | d. $\sqrt{30}$  |
- \_\_\_\_\_ 83. Simplify the expression  $\sqrt{192}$ .
- |                 |                 |
|-----------------|-----------------|
| a. $8\sqrt{3}$  | c. $64\sqrt{3}$ |
| b. $8\sqrt{24}$ | d. $\sqrt{24}$  |
- \_\_\_\_\_ 84. Simplify the expression  $\sqrt{24}$ .
- |                |                 |
|----------------|-----------------|
| a. $\sqrt{12}$ | c. $2\sqrt{6}$  |
| b. $4\sqrt{6}$ | d. $2\sqrt{12}$ |
- \_\_\_\_\_ 85. Simplify the expression  $\sqrt{16x^4y^3}$ . All variables represent nonnegative numbers.
- |                      |                      |
|----------------------|----------------------|
| a. $4x^2y\sqrt{y^2}$ | c. $4x^2y\sqrt{y}$   |
| b. $4\sqrt{y^2}$     | d. $4x^4y^2\sqrt{y}$ |
- \_\_\_\_\_ 86. Simplify the expression  $\sqrt{9r^3s^4}$ . All variables represent nonnegative numbers.
- |                      |                      |
|----------------------|----------------------|
| a. $3rs^2\sqrt{r^2}$ | c. $3\sqrt{r^2}$     |
| b. $3rs^2\sqrt{r}$   | d. $3r^2s^4\sqrt{r}$ |
- \_\_\_\_\_ 87. Simplify the expression  $\sqrt{x^3y^4}$ . All variables represent nonnegative numbers.
- |                   |                     |
|-------------------|---------------------|
| a. $xy^2\sqrt{x}$ | c. $x^2y^4\sqrt{x}$ |
| b. $\sqrt{x^2}$   | d. $xy^2\sqrt{x^2}$ |

\_\_\_ 88. Simplify  $\sqrt{\frac{x^9}{36x}}$ . The variable represents a nonnegative number.

a.  $\frac{\sqrt{x^8}}{6}$

c.  $\frac{x^4}{6}$

b.  $\frac{x^8}{36}$

d.  $\sqrt{\frac{x^4}{6}}$

\_\_\_ 89. Simplify  $\sqrt{\frac{b^7}{16b}}$ . The variable represents a nonnegative number.

a.  $\frac{b^6}{16}$

c.  $\sqrt{\frac{b^3}{4}}$

b.  $\frac{b^3}{4}$

d.  $\frac{\sqrt{b^6}}{4}$

\_\_\_ 90. Simplify  $\sqrt{\frac{x^9}{4x}}$ . The variable represents a nonnegative number.

a.  $\frac{x^8}{4}$

c.  $\frac{\sqrt{x^8}}{2}$

b.  $\frac{x^4}{2}$

d.  $\sqrt{\frac{x^4}{2}}$

\_\_\_ 91. Simplify  $\sqrt{\frac{x^7}{9x}}$ . The variable represents a nonnegative number.

a.  $\frac{\sqrt{x^6}}{3}$

c.  $\frac{x^3}{3}$

b.  $\sqrt{\frac{x^3}{3}}$

d.  $\frac{x^6}{9}$

\_\_\_ 92. Simplify  $\sqrt{\frac{x^{11}}{9x}}$ . The variable represents a nonnegative number.

a.  $\frac{\sqrt{x^{10}}}{3}$

c.  $\frac{x^{10}}{9}$

b.  $\frac{x^5}{3}$

d.  $\sqrt{\frac{x^5}{3}}$

\_\_\_ 93. Simplify  $\sqrt{\frac{a^{11}}{25a}}$ . The variable represents a nonnegative number.

a.  $\frac{\sqrt{a^{10}}}{5}$

c.  $\frac{a^5}{5}$

b.  $\frac{a^{10}}{25}$

d.  $\sqrt{\frac{a^5}{5}}$

\_\_\_ 94. Simplify  $\sqrt{\frac{x^7}{36x}}$ . The variable represents a nonnegative number.

a.  $\frac{x^3}{6}$

c.  $\frac{x^6}{36}$

b.  $\sqrt{\frac{x^3}{6}}$

d.  $\frac{\sqrt{x^6}}{6}$

\_\_\_ 95. Simplify  $\sqrt{\frac{z^7}{16z}}$ . The variable represents a nonnegative number.

a.  $\frac{\sqrt{z^6}}{4}$

c.  $\frac{z^3}{4}$

b.  $\frac{z^6}{16}$

d.  $\sqrt{\frac{z^3}{4}}$

\_\_\_ 96. Simplify  $\sqrt{\frac{a^7}{64a}}$ . The variable represents a nonnegative number.

a.  $\frac{a^3}{8}$

c.  $\frac{\sqrt{a^6}}{8}$

b.  $\frac{a^6}{64}$

d.  $\sqrt{\frac{a^3}{8}}$

\_\_\_ 97. Simplify  $\sqrt{\frac{z^5}{36z}}$ . The variable represents a nonnegative number.

a.  $\frac{z^2}{6}$

c.  $\frac{\sqrt{z^4}}{6}$

b.  $\sqrt{\frac{z^2}{6}}$

d.  $\frac{z^4}{36}$

\_\_\_ 98. Simplify  $\sqrt{\frac{a^3}{49a}}$ . The variable represents a nonnegative number.

a.  $\frac{\sqrt{a^2}}{7}$

c.  $\sqrt{\frac{a}{7}}$

b.  $\frac{a^2}{49}$

d.  $\frac{a}{7}$

\_\_\_\_ 99. Simplify  $\sqrt{\frac{250}{49}}$ .

a.  $\frac{10\sqrt{5}}{7}$

b.  $\frac{50}{7}$

c.  $\frac{5\sqrt{10}}{7}$

d.  $\frac{10}{7}$

\_\_\_\_ 100. Simplify  $\sqrt{\frac{600}{49}}$ .

a.  $\frac{6\sqrt{10}}{7}$

b.  $\frac{60}{7}$

c.  $\frac{6}{7}$

d.  $\frac{10\sqrt{6}}{7}$

\_\_\_\_ 101. Simplify  $\sqrt{\frac{63}{64}}$ .

a.  $\frac{21}{8}$

b.  $\frac{7}{8}$

c.  $\frac{7\sqrt{3}}{8}$

d.  $\frac{3\sqrt{7}}{8}$

\_\_\_\_ 102. Simplify  $\sqrt{\frac{486}{49}}$ .

a.  $\frac{9\sqrt{6}}{7}$

b.  $\frac{54}{7}$

c.  $\frac{6\sqrt{9}}{7}$

d.  $\frac{6}{7}$

\_\_\_\_ 103. Simplify  $\sqrt{\frac{150}{121}}$ .

a.  $\frac{5\sqrt{6}}{11}$

b.  $\frac{30}{11}$

c.  $\frac{6\sqrt{5}}{11}$

d.  $\frac{6}{11}$

\_\_\_\_ 104. Simplify  $\sqrt{\frac{294}{121}}$ .

a.  $\frac{6\sqrt{7}}{11}$

b.  $\frac{42}{11}$

c.  $\frac{6}{11}$

d.  $\frac{7\sqrt{6}}{11}$

\_\_\_\_ 105. Simplify  $\sqrt{\frac{500}{121}}$ .

a.  $\frac{50}{11}$

b.  $\frac{5\sqrt{10}}{11}$

c.  $\frac{10\sqrt{5}}{11}$

d.  $\frac{5}{11}$

\_\_\_\_ 106. Simplify  $\sqrt{\frac{392}{81}}$ .

a.  $\frac{56}{9}$

b.  $\frac{8}{9}$

c.  $\frac{7\sqrt{8}}{9}$

d.  $\frac{8\sqrt{7}}{9}$

\_\_\_\_ 107. Simplify  $\sqrt{\frac{405}{121}}$ .

a.  $\frac{9\sqrt{5}}{11}$

b.  $\frac{5}{11}$

c.  $\frac{5\sqrt{9}}{11}$

d.  $\frac{45}{11}$

\_\_\_\_ 108. Simplify  $\sqrt{\frac{242}{25}}$ .

a.  $\frac{2}{5}$

b.  $\frac{2\sqrt{11}}{5}$

c.  $\frac{22}{5}$

d.  $\frac{11\sqrt{2}}{5}$

\_\_\_\_ 109. Simplify  $\sqrt{\frac{250}{121}}$ .

a.  $\frac{10}{11}$

b.  $\frac{10\sqrt{5}}{11}$

c.  $\frac{5\sqrt{10}}{11}$

d.  $\frac{50}{11}$

\_\_\_\_ 110. Simplify  $\sqrt{\frac{700}{81}}$ .

a.  $\frac{7}{9}$

b.  $\frac{7\sqrt{10}}{9}$

c.  $\frac{10\sqrt{7}}{9}$

d.  $\frac{70}{9}$

\_\_\_\_ 111. Subtract.

$16\sqrt{3} - 7\sqrt{3}$

a.  $23\sqrt{6}$

b.  $23\sqrt{3}$

c.  $9\sqrt{3}$

d. 9

- \_\_\_\_\_ 112. Subtract.  
 $4\sqrt{3} - 18\sqrt{3}$   
a.  $22\sqrt{3}$  c.  $-14\sqrt{3}$   
b.  $-14$  d.  $22\sqrt{6}$
- \_\_\_\_\_ 113. Subtract.  
 $4\sqrt{7} - 11\sqrt{7}$   
a.  $-7\sqrt{7}$  c.  $-7$   
b.  $15\sqrt{14}$  d.  $15\sqrt{7}$
- \_\_\_\_\_ 114. Subtract.  
 $12\sqrt{5} - 13\sqrt{5}$   
a.  $25\sqrt{10}$  c.  $-1$   
b.  $-\sqrt{5}$  d.  $25\sqrt{5}$
- \_\_\_\_\_ 115. Subtract.  
 $2\sqrt{2} - 9\sqrt{2}$   
a.  $11\sqrt{4}$  c.  $-7\sqrt{2}$   
b.  $-7$  d.  $11\sqrt{2}$
- \_\_\_\_\_ 116. Add.  
 $6\sqrt{5} + 15\sqrt{5}$   
a.  $21\sqrt{5}$  c.  $-9\sqrt{5}$   
b.  $21$  d.  $-9\sqrt{10}$
- \_\_\_\_\_ 117. Subtract.  
 $11\sqrt{2} - 3\sqrt{2}$   
a.  $8$  c.  $14\sqrt{4}$   
b.  $8\sqrt{2}$  d.  $14\sqrt{2}$
- \_\_\_\_\_ 118. Add.  
 $7\sqrt{5} + 8\sqrt{5}$   
a.  $-\sqrt{5}$  c.  $15\sqrt{5}$   
b.  $-\sqrt{10}$  d.  $15$
- \_\_\_\_\_ 119. Add.  
 $18\sqrt{2} + 3\sqrt{2}$   
a.  $15\sqrt{4}$  c.  $21\sqrt{2}$   
b.  $15\sqrt{2}$  d.  $21$
- \_\_\_\_\_ 120. Subtract.  
 $12\sqrt{7} - 14\sqrt{7}$   
a.  $-2$  c.  $26\sqrt{7}$   
b.  $-2\sqrt{7}$  d.  $26\sqrt{14}$

- \_\_\_\_ 121. Subtract.  
 $15\sqrt{2} - 18\sqrt{2}$   
 a.  $33\sqrt{4}$  c.  $-3$   
 b.  $33\sqrt{2}$  d.  $-3\sqrt{2}$
- \_\_\_\_ 122. Subtract.  
 $11\sqrt{2} - 5\sqrt{2}$   
 a.  $16\sqrt{2}$  c.  $6$   
 b.  $6\sqrt{2}$  d.  $16\sqrt{4}$
- \_\_\_\_ 123. Simplify the expression  $\sqrt{8x} + 5\sqrt{50x} - 3\sqrt{18x}$ .  
 a.  $12\sqrt{2x}$  c.  $18\sqrt{2x}$   
 b.  $648x$  d.  $(\sqrt{8} + 5\sqrt{50} - 3\sqrt{18})\sqrt{x}$
- \_\_\_\_ 124. Simplify the expression  $\sqrt{18x} + 4\sqrt{8x} - 2\sqrt{50x}$ .  
 a.  $2x$  c.  $(\sqrt{18} + 4\sqrt{8} - 2\sqrt{50})\sqrt{x}$   
 b.  $12\sqrt{2x}$  d.  $\sqrt{2x}$
- \_\_\_\_ 125. Simplify the expression  $\sqrt{45y} + 4\sqrt{20y} - 3\sqrt{125y}$ .  
 a.  $80y$  c.  $(\sqrt{45} + 4\sqrt{20} - 3\sqrt{125})\sqrt{y}$   
 b.  $11\sqrt{5y}$  d.  $-4\sqrt{5y}$
- \_\_\_\_ 126. Simplify the expression  $\sqrt{8x} + 5\sqrt{50x} - \sqrt{18x}$ .  
 a.  $(\sqrt{8} + 5\sqrt{50} - \sqrt{18})\sqrt{x}$  c.  $14\sqrt{2x}$   
 b.  $24\sqrt{2x}$  d.  $1152x$
- \_\_\_\_ 127. Simplify the expression  $\sqrt{45a} + 4\sqrt{20a} - 3\sqrt{125a}$ .  
 a.  $80a$  c.  $(\sqrt{45} + 4\sqrt{20} - 3\sqrt{125})\sqrt{a}$   
 b.  $11\sqrt{5a}$  d.  $-4\sqrt{5a}$
- \_\_\_\_ 128. Simplify the expression  $\sqrt{125y} + 4\sqrt{20y} - 2\sqrt{45y}$ .  
 a.  $(\sqrt{125} + 4\sqrt{20} - 2\sqrt{45})\sqrt{y}$  c.  $245y$   
 b.  $12\sqrt{5y}$  d.  $7\sqrt{5y}$
- \_\_\_\_ 129. Simplify the expression  $\sqrt{75d} + 5\sqrt{12d} - \sqrt{27d}$ .  
 a.  $12\sqrt{3d}$  c.  $432d$   
 b.  $(\sqrt{75} + 5\sqrt{12} - \sqrt{27})\sqrt{d}$  d.  $14\sqrt{3d}$
- \_\_\_\_ 130. Simplify the expression  $\sqrt{12a} + 4\sqrt{75a} - \sqrt{27a}$ .  
 a.  $(\sqrt{12} + 4\sqrt{75} - \sqrt{27})\sqrt{a}$  c.  $13\sqrt{3a}$   
 b.  $1083a$  d.  $19\sqrt{3a}$

- \_\_\_\_ 131. Simplify the expression  $\sqrt{75x} + 5\sqrt{12x} - 3\sqrt{27x}$ .
- a.  $6\sqrt{3x}$  c.  $(\sqrt{75} + 5\sqrt{12} - 3\sqrt{27})\sqrt{x}$
- b.  $12\sqrt{3x}$  d.  $108x$
- \_\_\_\_ 132. Simplify the expression  $\sqrt{50y} + 4\sqrt{8y} - \sqrt{18y}$ .
- a.  $(\sqrt{50} + 4\sqrt{8} - \sqrt{18})\sqrt{y}$  c.  $13\sqrt{2y}$
- b.  $200y$  d.  $10\sqrt{2y}$
- \_\_\_\_ 133. Simplify the expression  $\sqrt{45b} + 4\sqrt{20b} - 3\sqrt{125b}$ .
- a.  $80b$  c.  $-4\sqrt{5b}$
- b.  $(\sqrt{45} + 4\sqrt{20} - 3\sqrt{125})\sqrt{b}$  d.  $11\sqrt{5b}$
- \_\_\_\_ 134. Simplify the expression  $\sqrt{125a} + 4\sqrt{20a} - 3\sqrt{45a}$ .
- a.  $(\sqrt{125} + 4\sqrt{20} - 3\sqrt{45})\sqrt{a}$  c.  $4\sqrt{5a}$
- b.  $11\sqrt{5a}$  d.  $80a$
- \_\_\_\_ 135. Simplify the expression  $\sqrt{45y} + 5\sqrt{20y} - 2\sqrt{125y}$ .
- a.  $3\sqrt{5y}$  c.  $13\sqrt{5y}$
- b.  $(\sqrt{45} + 5\sqrt{20} - 2\sqrt{125})\sqrt{y}$  d.  $45y$
- \_\_\_\_ 136. Simplify the expression  $\sqrt{8y} + 4\sqrt{50y} - 2\sqrt{18y}$ .
- a.  $16\sqrt{2y}$  c.  $(\sqrt{8} + 4\sqrt{50} - 2\sqrt{18})\sqrt{y}$
- b.  $12\sqrt{2y}$  d.  $512y$
- \_\_\_\_ 137. Simplify the expression  $\sqrt{18x} + 5\sqrt{8x} - \sqrt{50x}$ .
- a.  $14\sqrt{2x}$  c.  $(\sqrt{18} + 5\sqrt{8} - \sqrt{50})\sqrt{x}$
- b.  $8\sqrt{2x}$  d.  $128x$
- \_\_\_\_ 138. Simplify the expression  $\sqrt{27b} + 4\sqrt{12b} - 2\sqrt{75b}$ .
- a.  $12\sqrt{3b}$  c.  $3b$
- b.  $(\sqrt{27} + 4\sqrt{12} - 2\sqrt{75})\sqrt{b}$  d.  $\sqrt{3b}$
- \_\_\_\_ 139. Simplify the expression  $\sqrt{125y} + 5\sqrt{20y} - 3\sqrt{45y}$ .
- a.  $180y$  c.  $12\sqrt{5y}$
- b.  $6\sqrt{5y}$  d.  $(\sqrt{125} + 5\sqrt{20} - 3\sqrt{45})\sqrt{y}$
- \_\_\_\_ 140. Simplify the expression  $\sqrt{75b} + 5\sqrt{12b} - 2\sqrt{27b}$ .
- a.  $9\sqrt{3b}$  c.  $(\sqrt{75} + 5\sqrt{12} - 2\sqrt{27})\sqrt{b}$
- b.  $243b$  d.  $13\sqrt{3b}$



\_\_\_\_ 141. Simplify the expression  $\sqrt{75y} + 4\sqrt{12y} - \sqrt{27y}$ .

- a.  $(\sqrt{75} + 4\sqrt{12} - \sqrt{27})\sqrt{y}$       c.  $300y$   
b.  $10\sqrt{3y}$       d.  $13\sqrt{3y}$

\_\_\_\_ 142. Multiply. Write the product in simplest form.

- $\sqrt{21b} \sqrt{15b}$   
a.  $(\sqrt{315})b$       c.  $105b$   
b.  $(9\sqrt{35})b$       d.  $(3\sqrt{35})b$

\_\_\_\_ 143. Multiply. Write the product in simplest form.

- $\sqrt{15x} \sqrt{35x}$   
a.  $(\sqrt{525})x$       c.  $(25\sqrt{21})x$   
b.  $(5\sqrt{21})x$       d.  $105x$

\_\_\_\_ 144. Multiply. Write the product in simplest form.

- $\sqrt{35h} \sqrt{21h}$   
a.  $(7\sqrt{15})h$       c.  $(\sqrt{735})h$   
b.  $(49\sqrt{15})h$       d.  $105h$

\_\_\_\_ 145. Multiply. Write the product in simplest form.

- $\sqrt{15x} \sqrt{21x}$   
a.  $(\sqrt{315})x$       c.  $(9\sqrt{35})x$   
b.  $105x$       d.  $(3\sqrt{35})x$

\_\_\_\_ 146. Multiply. Write the product in simplest form.

- $\sqrt{15h} \sqrt{21h}$   
a.  $(3\sqrt{35})h$       c.  $(9\sqrt{35})h$   
b.  $(\sqrt{315})h$       d.  $105h$

\_\_\_\_ 147. Multiply. Write the product in simplest form.

$$\sqrt{4h} \sqrt{10h}$$

a.  $(\sqrt{40})h$

c.  $20h$

b.  $(4\sqrt{10})h$

d.  $(2\sqrt{10})h$

\_\_\_\_ 148. Multiply. Write the product in simplest form.

$$\sqrt{9h} \sqrt{6h}$$

a.  $(9\sqrt{6})h$

c.  $(3\sqrt{6})h$

b.  $18h$

d.  $(\sqrt{54})h$

\_\_\_\_ 149. Multiply. Write the product in simplest form.

$$\sqrt{6h} \sqrt{4h}$$

a.  $(\sqrt{24})h$

c.  $(2\sqrt{6})h$

b.  $12h$

d.  $(4\sqrt{6})h$

\_\_\_\_ 150. Multiply. Write the product in simplest form.

$$\sqrt{4b} \sqrt{6b}$$

a.  $(\sqrt{24})b$

c.  $(4\sqrt{6})b$

b.  $12b$

d.  $(2\sqrt{6})b$

\_\_\_\_ 151. Multiply. Write the product in simplest form.

$$\sqrt{10h} \sqrt{25h}$$

a.  $(\sqrt{250})h$

c.  $(5\sqrt{10})h$

b.  $(25\sqrt{10})h$

d.  $50h$

\_\_\_\_ 152. Multiply. Write the product in simplest form.

$$\sqrt{6b} \sqrt{14b}$$

a.  $(\sqrt{84})b$

c.  $(2\sqrt{21})b$

b.  $(4\sqrt{21})b$

d.  $42b$

\_\_\_\_ 153. Multiply. Write the product in simplest form.

$$\sqrt{4x} \sqrt{6x}$$

a.  $(2\sqrt{6})x$

b.  $12x$

c.  $(\sqrt{24})x$

d.  $(4\sqrt{6})x$

\_\_\_\_ 154. Multiply. Write the product in simplest form.

$$\sqrt{35x} \sqrt{14x}$$

a.  $70x$

b.  $(7\sqrt{10})x$

c.  $(49\sqrt{10})x$

d.  $(\sqrt{490})x$

\_\_\_\_ 155. Multiply. Write the product in simplest form.

$$\sqrt{14h} \sqrt{6h}$$

a.  $42h$

b.  $(\sqrt{84})h$

c.  $(4\sqrt{21})h$

d.  $(2\sqrt{21})h$

\_\_\_\_ 156. Multiply. Write the product in simplest form.

$$\sqrt{2}(\sqrt{4} + \sqrt{2})$$

a.  $2\sqrt{3}$

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

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

d.  $\sqrt{8} + \sqrt{4}$

\_\_\_\_ 157. Multiply. Write the product in simplest form.

$$\sqrt{9}(\sqrt{3} + \sqrt{9})$$

a.  $9\sqrt{3} + 27$

b.  $6\sqrt{3}$

c.  $3\sqrt{3} + 9$

d.  $\sqrt{27} + \sqrt{81}$

\_\_\_\_ 158. Multiply. Write the product in simplest form.

$$\sqrt{7}(\sqrt{8} + \sqrt{5})$$

a.  $\sqrt{91}$

b.  $\sqrt{56} + \sqrt{35}$

c.  $2\sqrt{14} + \sqrt{35}$

d.  $14\sqrt{2} + 7\sqrt{5}$

\_\_\_ 159. Multiply. Write the product in simplest form.

$$\sqrt{7}(\sqrt{4} + \sqrt{3})$$

a.  $\sqrt{28} + \sqrt{21}$

b. 7

c.  $2\sqrt{7} + \sqrt{21}$

d.  $14 + 7\sqrt{3}$

\_\_\_ 160. Multiply. Write the product in simplest form.

$$\sqrt{9}(\sqrt{4} + \sqrt{3})$$

a.  $6 + 3\sqrt{3}$

b.  $3\sqrt{7}$

c.  $\sqrt{36} + \sqrt{27}$

d.  $18 + 9\sqrt{3}$

\_\_\_ 161. Multiply. Write the product in simplest form.

$$\sqrt{9}(\sqrt{1} + \sqrt{7})$$

a.  $9 + 9\sqrt{7}$

b.  $6\sqrt{2}$

c.  $\sqrt{9} + \sqrt{63}$

d.  $3 + 3\sqrt{7}$

\_\_\_ 162. Multiply. Write the product in simplest form.

$$\sqrt{5}(\sqrt{8} + \sqrt{5})$$

a.  $\sqrt{65}$

b.  $2\sqrt{10} + 5$

c.  $\sqrt{40} + \sqrt{25}$

d.  $10\sqrt{2} + 5\sqrt{5}$

\_\_\_ 163. Multiply. Write the product in simplest form.

$$\sqrt{6}(\sqrt{4} + \sqrt{6})$$

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

b.  $\sqrt{24} + \sqrt{36}$

c.  $2\sqrt{15}$

d.  $12 + 6\sqrt{6}$

\_\_\_ 164. Multiply. Write the product in simplest form.

$$\sqrt{5}(\sqrt{4} + \sqrt{6})$$

a.  $\sqrt{20} + \sqrt{30}$

b.  $5\sqrt{2}$

c.  $10 + 5\sqrt{6}$

d.  $2\sqrt{5} + \sqrt{30}$

\_\_\_ 165. Multiply. Write the product in simplest form.

$$\sqrt{9}(\sqrt{1} + \sqrt{2})$$

a.  $\sqrt{9} + \sqrt{18}$

b.  $3\sqrt{3}$

c.  $9 + 9\sqrt{2}$

d.  $3 + 3\sqrt{2}$

\_\_\_ 166. Multiply. Write the product in simplest form.

$$\sqrt{6}(\sqrt{6} + \sqrt{7})$$

a.  $\sqrt{78}$

b.  $6\sqrt{6} + 6\sqrt{7}$

c.  $6 + \sqrt{42}$

d.  $\sqrt{36} + \sqrt{42}$

\_\_\_ 167. Multiply. Write the product in simplest form.

$$\sqrt{5}(\sqrt{4} + \sqrt{3})$$

a.  $2\sqrt{5} + \sqrt{15}$

b.  $10 + 5\sqrt{3}$

c.  $\sqrt{35}$

d.  $\sqrt{20} + \sqrt{15}$

\_\_\_ 168. Multiply. Write the product in simplest form.

$$\sqrt{7}(\sqrt{8} + \sqrt{6})$$

a.  $14\sqrt{2} + 7\sqrt{6}$

b.  $7\sqrt{2}$

c.  $\sqrt{56} + \sqrt{42}$

d.  $2\sqrt{14} + \sqrt{42}$

\_\_\_ 169. Multiply. Write the product in simplest form.

$$\sqrt{4}(\sqrt{4} + \sqrt{8})$$

a.  $4\sqrt{3}$

b.  $8 + 8\sqrt{2}$

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

d.  $\sqrt{16} + \sqrt{32}$

\_\_\_ 170. Multiply. Write the product in simplest form.

$$\sqrt{2}(\sqrt{2} + \sqrt{9})$$

a.  $2 + 3\sqrt{2}$

b.  $\sqrt{22}$

c.  $2\sqrt{2} + 6$

d.  $\sqrt{4} + \sqrt{18}$

\_\_\_ 171. Multiply. Write the product in simplest form.

$$\sqrt{8}(\sqrt{2} + \sqrt{8})$$

a.  $4\sqrt{5}$

b.  $\sqrt{16} + \sqrt{64}$

c. 12

d.  $8\sqrt{2} + 16\sqrt{2}$

\_\_\_ 172. Multiply  $(\sqrt{2} - 4)^2$ . Write the product in simplest form.

a.  $-14 - 8\sqrt{2}$

b. -14

c.  $18 - 8\sqrt{2}$

d.  $10\sqrt{2}$





\_\_\_\_ 191. Simplify the quotient  $\frac{\sqrt{15}}{\sqrt{2}}$ .

a.  $\frac{\sqrt{30}}{2}$

b.  $\frac{15}{2}$

c.  $\frac{15}{\sqrt{30}}$

d.  $\frac{\sqrt{15}}{2}$

\_\_\_\_ 192. Simplify the quotient  $\frac{\sqrt{3}}{\sqrt{10}}$ .

a.  $\frac{3}{\sqrt{30}}$

b.  $\frac{3}{10}$

c.  $\frac{\sqrt{3}}{10}$

d.  $\frac{\sqrt{30}}{10}$

\_\_\_\_ 193. Simplify the quotient  $\frac{\sqrt{6}}{\sqrt{5}}$ .

a.  $\frac{6}{\sqrt{30}}$

b.  $\frac{6}{5}$

c.  $\frac{\sqrt{30}}{5}$

d.  $\frac{\sqrt{6}}{5}$

\_\_\_\_ 194. Simplify the quotient  $\frac{\sqrt{7}}{\sqrt{5}}$ .

a.  $\frac{\sqrt{7}}{5}$

b.  $\frac{7}{\sqrt{35}}$

c.  $\frac{\sqrt{35}}{5}$

d.  $\frac{7}{5}$

\_\_\_\_ 195. Simplify the quotient  $\frac{\sqrt{6}}{\sqrt{7}}$ .

a.  $\frac{6}{7}$

b.  $\frac{6}{\sqrt{42}}$

c.  $\frac{\sqrt{6}}{7}$

d.  $\frac{\sqrt{42}}{7}$

\_\_\_\_ 196. Simplify the quotient  $\frac{\sqrt{7}}{\sqrt{2}}$ .

a.  $\frac{\sqrt{7}}{2}$

b.  $\frac{7}{2}$

c.  $\frac{7}{\sqrt{14}}$

d.  $\frac{\sqrt{14}}{2}$



\_\_\_\_ 197. Simplify the quotient  $\frac{\sqrt{5}}{\sqrt{6}}$ .

a.  $\frac{\sqrt{5}}{6}$

b.  $\frac{\sqrt{30}}{6}$

c.  $\frac{5}{\sqrt{30}}$

d.  $\frac{5}{6}$

\_\_\_\_ 198. Simplify the quotient  $\frac{\sqrt{7}}{\sqrt{6}}$ .

a.  $\frac{7}{\sqrt{42}}$

b.  $\frac{\sqrt{42}}{6}$

c.  $\frac{7}{6}$

d.  $\frac{\sqrt{7}}{6}$

\_\_\_\_ 199. Simplify the quotient  $\frac{\sqrt{3}}{\sqrt{13}}$ .

a.  $\frac{3}{\sqrt{39}}$

b.  $\frac{\sqrt{39}}{13}$

c.  $\frac{\sqrt{3}}{13}$

d.  $\frac{3}{13}$

\_\_\_\_ 200. Simplify the quotient  $\frac{\sqrt{2}}{\sqrt{13}}$ .

a.  $\frac{2}{\sqrt{26}}$

b.  $\frac{2}{13}$

c.  $\frac{\sqrt{2}}{13}$

d.  $\frac{\sqrt{26}}{13}$

\_\_\_\_ 201. Simplify the quotient  $\frac{\sqrt{2}}{\sqrt{5}}$ .

a.  $\frac{\sqrt{10}}{5}$

b.  $\frac{\sqrt{2}}{5}$

c.  $\frac{2}{5}$

d.  $\frac{2}{\sqrt{10}}$

\_\_\_\_ 202. Simplify the quotient  $\frac{\sqrt{11}}{\sqrt{7}}$ .

a.  $\frac{\sqrt{77}}{7}$

b.  $\frac{11}{\sqrt{77}}$

c.  $\frac{11}{7}$

d.  $\frac{\sqrt{11}}{7}$

\_\_\_\_ 203. Simplify the quotient  $\frac{\sqrt{5}}{\sqrt{3}}$ .

a.  $\frac{5}{3}$

b.  $\frac{\sqrt{5}}{3}$

c.  $\frac{\sqrt{15}}{3}$

d.  $\frac{5}{\sqrt{15}}$

\_\_\_\_ 204. Simplify the quotient  $\frac{\sqrt{2}}{\sqrt{7}}$ .

a.  $\frac{\sqrt{2}}{7}$

b.  $\frac{2}{7}$

c.  $\frac{\sqrt{14}}{7}$

d.  $\frac{2}{\sqrt{14}}$

\_\_\_\_ 205. Simplify the quotient  $\frac{\sqrt{7}}{\sqrt{3}}$ .

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

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

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

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

\_\_\_\_ 206. Simplify  $\frac{5}{\sqrt{14} - \sqrt{13}}$ .

a. 5

b.  $5\sqrt{14} - 5\sqrt{13}$

c.  $5\sqrt{14} + 5\sqrt{13}$

d.  $\frac{5\sqrt{14} + 5\sqrt{13}}{\sqrt{14} - \sqrt{13}}$

\_\_\_\_ 207. Simplify  $\frac{9}{\sqrt{3} - \sqrt{2}}$ .

a.  $\frac{9\sqrt{3} + 9\sqrt{2}}{\sqrt{3} - \sqrt{2}}$

b.  $9\sqrt{3} + 9\sqrt{2}$

c. 9

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

\_\_\_\_ 208. Simplify  $\frac{5}{\sqrt{3} - \sqrt{2}}$ .

a. 5

b.  $5\sqrt{3} - 5\sqrt{2}$

c.  $5\sqrt{3} + 5\sqrt{2}$

d.  $\frac{5\sqrt{3} + 5\sqrt{2}}{\sqrt{3} - \sqrt{2}}$

\_\_\_\_ 209. Simplify  $\frac{7}{\sqrt{3}-\sqrt{2}}$ .

a. 7

b.  $\frac{7\sqrt{3}+7\sqrt{2}}{\sqrt{3}-\sqrt{2}}$

c.  $7\sqrt{3}+7\sqrt{2}$

d.  $7\sqrt{3}-7\sqrt{2}$

\_\_\_\_ 210. Simplify  $\frac{8}{\sqrt{6}-\sqrt{5}}$ .

a.  $8\sqrt{6}+8\sqrt{5}$

b.  $8\sqrt{6}-8\sqrt{5}$

c.  $\frac{8\sqrt{6}+8\sqrt{5}}{\sqrt{6}-\sqrt{5}}$

d. 8

\_\_\_\_ 211. Simplify  $\frac{4}{\sqrt{14}-\sqrt{13}}$ .

a.  $4\sqrt{14}-4\sqrt{13}$

b. 4

c.  $\frac{4\sqrt{14}+4\sqrt{13}}{\sqrt{14}-\sqrt{13}}$

d.  $4\sqrt{14}+4\sqrt{13}$

\_\_\_\_ 212. Simplify  $\frac{8}{\sqrt{11}-\sqrt{10}}$ .

a.  $8\sqrt{11}-8\sqrt{10}$

b. 8

c.  $\frac{8\sqrt{11}+8\sqrt{10}}{\sqrt{11}-\sqrt{10}}$

d.  $8\sqrt{11}+8\sqrt{10}$

\_\_\_\_ 213. Simplify  $\frac{6}{\sqrt{11}-\sqrt{10}}$ .

a.  $6\sqrt{11}+6\sqrt{10}$

b. 6

c.  $6\sqrt{11}-6\sqrt{10}$

d.  $\frac{6\sqrt{11}+6\sqrt{10}}{\sqrt{11}-\sqrt{10}}$

\_\_\_\_ 214. Simplify  $\frac{2}{\sqrt{3}-\sqrt{2}}$ .

a.  $2\sqrt{3}-2\sqrt{2}$

b. 2

c.  $\frac{2\sqrt{3}+2\sqrt{2}}{\sqrt{3}-\sqrt{2}}$

d.  $2\sqrt{3}+2\sqrt{2}$

\_\_\_\_ 215. Simplify  $\frac{7}{\sqrt{14}-\sqrt{13}}$ .

a. 7

b.  $7\sqrt{14}+7\sqrt{13}$

c.  $\frac{7\sqrt{14}+7\sqrt{13}}{\sqrt{14}-\sqrt{13}}$

d.  $7\sqrt{14}-7\sqrt{13}$

\_\_\_\_ 216. Simplify  $\frac{3}{\sqrt{3}-\sqrt{2}}$ .

a.  $\frac{3\sqrt{3}+3\sqrt{2}}{\sqrt{3}-\sqrt{2}}$

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

c.  $3\sqrt{3}+3\sqrt{2}$

d. 3

\_\_\_\_ 217. Simplify  $\frac{3}{\sqrt{7}-\sqrt{6}}$ .

a. 3

b.  $3\sqrt{7}+3\sqrt{6}$

c.  $3\sqrt{7}-3\sqrt{6}$

d.  $\frac{3\sqrt{7}+3\sqrt{6}}{\sqrt{7}-\sqrt{6}}$

\_\_\_\_ 218. Simplify  $\frac{4}{\sqrt{7}-\sqrt{6}}$ .

a.  $\frac{4\sqrt{7}+4\sqrt{6}}{\sqrt{7}-\sqrt{6}}$

b.  $4\sqrt{7}-4\sqrt{6}$

c. 4

d.  $4\sqrt{7}+4\sqrt{6}$

\_\_\_\_ 219. Simplify  $\frac{9}{\sqrt{14}-\sqrt{13}}$ .

a. 9

b.  $9\sqrt{14}+9\sqrt{13}$

c.  $\frac{9\sqrt{14}+9\sqrt{13}}{\sqrt{14}-\sqrt{13}}$

d.  $9\sqrt{14}-9\sqrt{13}$

\_\_\_\_ 220. Simplify  $\frac{3}{\sqrt{6}-\sqrt{5}}$ .

a.  $3\sqrt{6}-3\sqrt{5}$

b.  $3\sqrt{6}+3\sqrt{5}$

c.  $\frac{3\sqrt{6}+3\sqrt{5}}{\sqrt{6}-\sqrt{5}}$

d. 3

\_\_\_\_ 221. Simplify  $\frac{7}{\sqrt{7}-\sqrt{6}}$ .

a. 7

b.  $7\sqrt{7}-7\sqrt{6}$

c.  $7\sqrt{7}+7\sqrt{6}$

d.  $\frac{7\sqrt{7}+7\sqrt{6}}{\sqrt{7}-\sqrt{6}}$

\_\_\_\_ 222. Simplify  $\frac{6}{\sqrt{3}-\sqrt{2}}$ .

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

b.  $6\sqrt{3}-6\sqrt{2}$

c. 6

d.  $\frac{6\sqrt{3}+6\sqrt{2}}{\sqrt{3}-\sqrt{2}}$

\_\_\_\_ 223. Simplify  $\frac{6}{\sqrt{6}-\sqrt{5}}$ .

a.  $6\sqrt{6}+6\sqrt{5}$

b. 6

c.  $\frac{6\sqrt{6}+6\sqrt{5}}{\sqrt{6}-\sqrt{5}}$

d.  $6\sqrt{6}-6\sqrt{5}$

\_\_\_\_ 224. Simplify  $\frac{9}{\sqrt{7}-\sqrt{6}}$ .

a. 9

b.  $9\sqrt{7}-9\sqrt{6}$

c.  $\frac{9\sqrt{7}+9\sqrt{6}}{\sqrt{7}-\sqrt{6}}$

d.  $9\sqrt{7}+9\sqrt{6}$

\_\_\_\_ 225. Simplify  $\frac{5}{\sqrt{3}-\sqrt{2}}$ .

a.  $5\sqrt{3}-5\sqrt{2}$

b.  $5\sqrt{3}+5\sqrt{2}$

c. 5

d.  $\frac{5\sqrt{3}+5\sqrt{2}}{\sqrt{3}-\sqrt{2}}$

\_\_\_\_ 226. Simplify the expression  $\sqrt{54}$ .

a.  $3\sqrt{6}$

b.  $9\sqrt{6}$

c.  $\sqrt{18}$

d.  $3\sqrt{18}$

\_\_\_\_ 227. Simplify the expression  $\sqrt{240}$ .

a.  $4\sqrt{15}$

b.  $\sqrt{60}$

c.  $16\sqrt{15}$

d.  $4\sqrt{60}$

\_\_\_\_ 228. Simplify the expression  $\sqrt{96}$ .

a.  $\sqrt{24}$

b.  $4\sqrt{6}$

c.  $16\sqrt{6}$

d.  $4\sqrt{24}$

\_\_\_\_ 229. Simplify the expression  $\sqrt{135}$ .

a.  $\sqrt{45}$

b.  $9\sqrt{15}$

c.  $3\sqrt{45}$

d.  $3\sqrt{15}$

\_\_\_\_ 230. Simplify the expression  $\sqrt{75}$ .

a.  $\sqrt{15}$

b.  $5\sqrt{3}$

c.  $25\sqrt{3}$

d.  $5\sqrt{15}$

\_\_\_\_ 231. Simplify the expression  $\sqrt{16r^3s^4}$ . All variables represent nonnegative numbers.

a.  $4rs^2\sqrt{r}$

b.  $4\sqrt{r^2}$

c.  $4rs^2\sqrt{r^2}$

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

- \_\_\_\_\_ 232. Simplify the expression  $\sqrt{w^5 z^3}$ . All variables represent nonnegative numbers.  
 a.  $w^4 z^2 \sqrt{wz}$   
 b.  $\sqrt{w^2 z^2}$   
 c.  $w^2 z \sqrt{wz}$   
 d.  $w^2 z \sqrt{w^2 z^2}$
- \_\_\_\_\_ 233. Simplify the expression  $\sqrt{16a^2 b^5}$ . All variables represent nonnegative numbers.  
 a.  $4a b^2 \sqrt{b}$   
 b.  $4\sqrt{b^2}$   
 c.  $4a^2 b^4 \sqrt{b}$   
 d.  $4a b^2 \sqrt{b^2}$
- \_\_\_\_\_ 234. Simplify the expression  $\sqrt{9c^3 d^5}$ . All variables represent nonnegative numbers.  
 a.  $3c^2 d^4 \sqrt{cd}$   
 b.  $3\sqrt{c^2 d^2}$   
 c.  $3c d^2 \sqrt{c^2 d^2}$   
 d.  $3c d^2 \sqrt{cd}$
- \_\_\_\_\_ 235. Simplify the expression  $\sqrt{300}$ .  
 a.  $10 \sqrt{30}$   
 b.  $10 \sqrt{3}$   
 c.  $100 \sqrt{3}$   
 d.  $\sqrt{30}$
- \_\_\_\_\_ 236. Simplify the expression  $\sqrt{12}$ .  
 a.  $4 \sqrt{3}$   
 b.  $\sqrt{6}$   
 c.  $2 \sqrt{3}$   
 d.  $2 \sqrt{6}$
- \_\_\_\_\_ 237. Simplify the expression  $\sqrt{w^5 z^2}$ . All variables represent nonnegative numbers.  
 a.  $w^2 z \sqrt{w^2}$   
 b.  $w^4 z^2 \sqrt{w}$   
 c.  $w^2 z \sqrt{w}$   
 d.  $\sqrt{w^2}$
- \_\_\_\_\_ 238. Simplify the expression  $\sqrt{4x^4 y^5}$ . All variables represent nonnegative numbers.  
 a.  $2x^2 y^2 \sqrt{y}$   
 b.  $2x^4 y^4 \sqrt{y}$   
 c.  $2x^2 y^2 \sqrt{y^2}$   
 d.  $2\sqrt{y^2}$
- \_\_\_\_\_ 239. Simplify the expression  $\sqrt{4c^2 d^5}$ . All variables represent nonnegative numbers.  
 a.  $2c^2 d^4 \sqrt{d}$   
 b.  $2c d^2 \sqrt{d}$   
 c.  $2\sqrt{d^2}$   
 d.  $2c d^2 \sqrt{d^2}$
- \_\_\_\_\_ 240. Simplify the expression  $\sqrt{192}$ .  
 a.  $\sqrt{24}$   
 b.  $64 \sqrt{3}$   
 c.  $8 \sqrt{24}$   
 d.  $8 \sqrt{3}$
- \_\_\_\_\_ 241. Simplify the expression  $\sqrt{12}$ .  
 a.  $2 \sqrt{6}$   
 b.  $\sqrt{6}$   
 c.  $2 \sqrt{3}$   
 d.  $4 \sqrt{3}$

- \_\_\_\_\_ 242. Simplify the expression  $\sqrt{16a^3b^4}$ . All variables represent nonnegative numbers.
- |                      |                      |
|----------------------|----------------------|
| a. $4\sqrt{a^2}$     | c. $4ab^2\sqrt{a}$   |
| b. $4ab^2\sqrt{a^2}$ | d. $4a^2b^4\sqrt{a}$ |
- \_\_\_\_\_ 243. Simplify the expression  $\sqrt{w^4z^5}$ . All variables represent nonnegative numbers.
- |                     |                       |
|---------------------|-----------------------|
| a. $w^2z^2\sqrt{z}$ | c. $w^2z^2\sqrt{z^2}$ |
| b. $w^4z^4\sqrt{z}$ | d. $\sqrt{z^2}$       |
- \_\_\_\_\_ 244. Simplify the expression  $\sqrt{135}$ .
- |                 |                 |
|-----------------|-----------------|
| a. $\sqrt{45}$  | c. $3\sqrt{45}$ |
| b. $9\sqrt{15}$ | d. $3\sqrt{15}$ |
- \_\_\_\_\_ 245. Simplify the expression  $\sqrt{9w^3z^3}$ . All variables represent nonnegative numbers.
- |                       |                       |
|-----------------------|-----------------------|
| a. $3wz\sqrt{wz}$     | c. $3\sqrt{w^2z^2}$   |
| b. $3wz\sqrt{w^2z^2}$ | d. $3w^2z^2\sqrt{wz}$ |
- \_\_\_\_\_ 246. Simplify the expression  $\sqrt{9a^4b^3}$ . All variables represent nonnegative numbers.
- |                    |                      |
|--------------------|----------------------|
| a. $3\sqrt{b^2}$   | c. $3a^4b^2\sqrt{b}$ |
| b. $3a^2b\sqrt{b}$ | d. $3a^2b\sqrt{b^2}$ |
- \_\_\_\_\_ 247. Simplify the expression  $\sqrt{r^3s^5}$ . All variables represent nonnegative numbers.
- |                      |                        |
|----------------------|------------------------|
| a. $rs^2\sqrt{rs}$   | c. $\sqrt{r^2s^2}$     |
| b. $r^2s^4\sqrt{rs}$ | d. $rs^2\sqrt{r^2s^2}$ |
- \_\_\_\_\_ 248. Simplify the expression  $\sqrt{9a^4b^3}$ . All variables represent nonnegative numbers.
- |                      |                    |
|----------------------|--------------------|
| a. $3a^2b\sqrt{b^2}$ | c. $3\sqrt{b^2}$   |
| b. $3a^4b^2\sqrt{b}$ | d. $3a^2b\sqrt{b}$ |
- \_\_\_\_\_ 249. Simplify the expression  $\sqrt{135}$ .
- |                 |                 |
|-----------------|-----------------|
| a. $3\sqrt{45}$ | c. $\sqrt{45}$  |
| b. $9\sqrt{15}$ | d. $3\sqrt{15}$ |
- \_\_\_\_\_ 250. Simplify the expression  $\sqrt{150}$ .
- |                 |                 |
|-----------------|-----------------|
| a. $\sqrt{30}$  | c. $5\sqrt{30}$ |
| b. $25\sqrt{6}$ | d. $5\sqrt{6}$  |

**Simplifying Radicals**  
**Answer Section**

**MULTIPLE CHOICE**

1. A
2. D
3. C
4. B
5. C
6. A
7. D
8. B
9. C
10. B
11. A
12. C
13. A
14. C
15. A
16. C
17. B
18. D
19. B
20. A
21. B
22. D
23. B
24. A
25. D
26. C
27. B
28. B
29. A
30. A
31. B
32. A
33. C
34. D
35. B
36. A
37. A
38. C
39. A



- 40. B
- 41. C
- 42. B
- 43. B
- 44. D
- 45. D
- 46. A
- 47. B
- 48. D
- 49. C
- 50. A
- 51. C
- 52. D
- 53. B
- 54. D
- 55. B
- 56. D
- 57. D
- 58. D
- 59. B
- 60. A
- 61. D
- 62. C
- 63. B
- 64. D
- 65. A
- 66. B
- 67. C
- 68. B
- 69. A
- 70. A
- 71. A
- 72. B
- 73. C
- 74. B
- 75. D
- 76. B
- 77. D
- 78. A
- 79. B
- 80. A
- 81. D
- 82. B
- 83. A
- 84. C

- 85. C
- 86. B
- 87. A
- 88. C
- 89. B
- 90. B
- 91. C
- 92. B
- 93. C
- 94. A
- 95. C
- 96. A
- 97. A
- 98. D
- 99. C
- 100. D
- 101. D
- 102. A
- 103. A
- 104. D
- 105. C
- 106. C
- 107. A
- 108. D
- 109. C
- 110. C
- 111. C
- 112. C
- 113. A
- 114. B
- 115. C
- 116. A
- 117. B
- 118. C
- 119. C
- 120. B
- 121. D
- 122. B
- 123. C
- 124. D
- 125. D
- 126. B
- 127. D
- 128. D
- 129. A

- 130. D
- 131. A
- 132. D
- 133. C
- 134. C
- 135. A
- 136. A
- 137. B
- 138. D
- 139. B
- 140. A
- 141. B
- 142. D
- 143. B
- 144. A
- 145. D
- 146. A
- 147. D
- 148. C
- 149. C
- 150. D
- 151. C
- 152. C
- 153. A
- 154. B
- 155. D
- 156. C
- 157. C
- 158. C
- 159. C
- 160. A
- 161. D
- 162. B
- 163. A
- 164. D
- 165. D
- 166. C
- 167. A
- 168. D
- 169. C
- 170. A
- 171. C
- 172. C
- 173. C
- 174. C

- 175. B
- 176. C
- 177. C
- 178. C
- 179. C
- 180. C
- 181. C
- 182. B
- 183. B
- 184. C
- 185. C
- 186. D
- 187. D
- 188. C
- 189. A
- 190. D
- 191. A
- 192. D
- 193. C
- 194. C
- 195. D
- 196. D
- 197. B
- 198. B
- 199. B
- 200. D
- 201. A
- 202. A
- 203. C
- 204. C
- 205. D
- 206. C
- 207. B
- 208. C
- 209. C
- 210. A
- 211. D
- 212. D
- 213. A
- 214. D
- 215. B
- 216. C
- 217. B
- 218. D
- 219. B

- 220. B
- 221. C
- 222. A
- 223. A
- 224. D
- 225. B
- 226. A
- 227. A
- 228. B
- 229. D
- 230. B
- 231. A
- 232. C
- 233. A
- 234. D
- 235. B
- 236. C
- 237. C
- 238. A
- 239. B
- 240. D
- 241. C
- 242. C
- 243. A
- 244. D
- 245. A
- 246. B
- 247. A
- 248. D
- 249. D
- 250. D