

# Chapter 11 Review

## Vocabulary

converse	legs of a right triangle	product law for roots	radical sign
cube root	perfect cube	Pythagorean theorem	radicand
hypotenuse	perfect square	quotient law for square roots	simplified radical
index of a radical	principal root	radical equation	square root

Simplify the following. If no answer exists, state "not real."

1.  $\sqrt{196}$  14      2.  $-\sqrt{-36}$  not real      3.  $\sqrt{-25}$  not real      4.  $-\sqrt{16}$  -4

Simplify the following.

5.  $\sqrt{25+144}$  13      6.  $\frac{4\sqrt{121}}{\sqrt{36}}$   $\frac{22}{3}$       7.  $2\sqrt{25-16} + \sqrt{81}$  15      8.  $\sqrt{36(4)}$  12

Find the consecutive integers between which the following roots lie.

9.  $\sqrt{11}$  3 and 4      10.  $-\sqrt{147}$  -13 and -12      11.  $\sqrt[3]{36}$  3 and 4      12.  $\sqrt[3]{-70}$  -5 and -4

Estimate the following square roots to the nearest tenth.

13.  $\sqrt{21}$  4.6      14.  $\sqrt{116}$  10.8

Solve and check the following equations. If no answer exists, state "no real solution."

15.  $\sqrt{x} - 5 = -2$   $x = 9$       16.  $\sqrt{x} = 1.7$   $x = 2.89$       17.  $3\sqrt{2x} + 9 = 0$  no real solution      18.  $2\sqrt{4x-3} = 6$   $x = 3$

Solve. Leave answers in simplified radical form if the radicand is not a perfect square. If no answer exists, state "no real solution."

19.  $x^2 + 31 = 112$   $x = \pm 9$       20.  $7x^2 = 56$   $x = \pm 2\sqrt{2}$       21.  $\frac{x^2}{3} - 1 = 11$   $x = \pm 6$       22.  $4x^2 + 12 = 8$  no real solution

Given the lengths of the legs, find the hypotenuse of the following right triangles. Simplify irrational roots or round to the nearest tenth.

23. 15 and 8 17      24. 5 and 5  $5\sqrt{2} \approx 7.1$

Given the hypotenuse and one leg, find the missing leg. Simplify irrational roots or round to the nearest tenth.

25. 34 and 30 16      26. 6 and 3  $3\sqrt{3} \approx 5.2$

Given the three side lengths, determine whether the following triangles are right triangles.

27. 10, 25, and 27 no      28. 16, 30, and 34 yes

Simplify the following radicals.

29.  $\sqrt{8,100}$  90      30.  $\sqrt{250,000}$  500      31.  $\sqrt{252}$   $6\sqrt{7}$       32.  $\sqrt{80}$   $4\sqrt{5}$

Simplify the following radical expressions.

33.  $\sqrt{6}\sqrt{30}$   $6\sqrt{5}$       34.  $3\sqrt{10}(2\sqrt{15})$   $30\sqrt{6}$       35.  $\frac{\sqrt{36}}{\sqrt{2}}$   $3\sqrt{2}$       36.  $\sqrt{\frac{25}{121}}$   $\frac{5}{11}$   
 37.  $\frac{3\sqrt{8}}{6}$   $\sqrt{2}$       38.  $7\sqrt{3} - 3\sqrt{3} + \sqrt{3}$   $5\sqrt{3}$       39.  $9\sqrt{5} + \sqrt{5} - 6\sqrt{7}$   $10\sqrt{5} - 6\sqrt{7}$       40.  $2\sqrt{50} - \sqrt{72}$   $4\sqrt{2}$   
 41.  $3\sqrt{27} - \sqrt{125} + 2\sqrt{75} + \sqrt{45}$   $19\sqrt{3} - 2\sqrt{5}$

Find the following perfect cubes or cube roots.

42.  $(-4)^3$  -64      43.  $5^3$  125      44.  $\sqrt[3]{-1}$  -1      45.  $\sqrt[3]{216}$  6      46.  $\sqrt[3]{1,331}$  11

47. Give the mathematical significance of Revelation 21:16.

The New Jerusalem is a cube, 12,000 furlongs in each dimension.