

key.

Section 9.1: Radicals Academic Systems

Exponent rules: Assuming that variables satisfy basic conditions outline in the text book, we have the following rules:

a.) $a^x a^y = a^{x+y}$

b.) $\frac{a^x}{a^y} = a^{x-y}$

c.) $(a^x)^y = a^{xy}$

d.) $a^{-x} = \frac{1}{a^x}$

e.) $a^0 = 1, a \neq 0$ and 0^0 is undefined.

Principal square roots: $\sqrt{a^2} = |a|$

perfect squares	
Value	Square
1	1
2	4
3	9
4	16
5	25
6	36
7	49
8	64
9	81
10	100

perfect cubes	
Value	Cube
1	1
2	8
3	27
4	64
5	125
6	216

(principal) square roots of perfect squares	
Root of square	Value
$\sqrt{1}$	1
$\sqrt{4}$	2
$\sqrt{9}$	3
$\sqrt{16}$	4
$\sqrt{25}$	5
$\sqrt{36}$	6
$\sqrt{49}$	7
$\sqrt{64}$	8
$\sqrt{81}$	9
$\sqrt{100}$	10

Cube roots	
Root of cube	Value
$\sqrt[3]{1}$	1
$\sqrt[3]{8}$	2
$\sqrt[3]{27}$	3
$\sqrt[3]{64}$	4
$\sqrt[3]{125}$	5
$\sqrt[3]{216}$	6

4.) Solve $\sqrt{2x-3}+16=19$

$$\sqrt{2x-3} = 3$$

$$\Rightarrow 2x-3 = 9$$

$$\Rightarrow 2x = 12$$

$$\Rightarrow x = 6$$

check $\sqrt{2(6)-3} + 16 \stackrel{?}{=} 19$

$$= \sqrt{9} + 16 \stackrel{?}{=} 19$$

$$= 3 + 16 \checkmark = 19$$

5.) Simplify $\sqrt{3}-\sqrt{12}+\sqrt{27}$

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

$$= 2\sqrt{3}$$

6.) Simplify $\frac{3}{1+\sqrt{7}} \cdot \frac{1-\sqrt{7}}{1-\sqrt{7}}$

$$= \frac{3(1-\sqrt{7})}{1-7}$$

$$= \frac{3(1-\sqrt{7})}{-6}$$

$$= \frac{1-\sqrt{7}}{-2}$$

7.) $(4\sqrt{5}+3)(2\sqrt{7}-5)$

$$= 8\sqrt{35} - 20\sqrt{5} + 6\sqrt{7} - 15$$