

## Simplifying Square Roots

Name \_\_\_\_\_

Date \_\_\_\_\_ Period \_\_\_\_\_

$x$	$x^2$
1	1
2	4
3	9
4	16
5	25
6	36
7	49
8	64
9	81
10	100

perfect  
squares

Simplify Square Roots using the Product Property

for every number  $m \geq 0$  and  $n \geq 0$ ,

$$\sqrt{m \cdot n} = \sqrt{m} \cdot \sqrt{n}$$

$$\sqrt{18}$$

$$\sqrt{20} \cdot \sqrt{5}$$

$$\sqrt{24}$$

$$\sqrt{18} \cdot \sqrt{2}$$

$x$	$x^2$
1	1
2	4
3	9
4	16
5	25
6	36
7	49
8	64
9	81
10	100

perfect  
squares

Simplify Square Roots using the Quotient Property

for every number  $m \geq 0$  and  $n > 0$ ,

$$\sqrt{\frac{m}{n}} = \frac{\sqrt{m}}{\sqrt{n}}$$

$$\sqrt{\frac{25}{4}}$$

$$\frac{\sqrt{75}}{\sqrt{3}}$$

$$\sqrt{\frac{9}{49}}$$

$$\frac{\sqrt{96}}{\sqrt{6}}$$

$x$	$x^2$	perfect squares
1	1	
2	4	
3	9	
4	16	
5	25	
6	36	
7	49	
8	64	
9	81	
10	100	

Simplify **Square Roots** by rationalizing the denominator

All **perfect squares** are factored out

No **radicals** allowed in the **denominator** of a fraction

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

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

$x$	$x^2$	perfect squares
1	1	
2	4	
3	9	
4	16	
5	25	
6	36	
7	49	
8	64	
9	81	
10	100	

Simplify **Square Roots** by combining like radical terms

Like radical terms have the same radicand

$$6\sqrt{2} + 4\sqrt{2}$$

Like **radical** terms

$$6\sqrt{3} + 4\sqrt{5}$$

Unlike **radical** terms

$$3\sqrt{3} + 5\sqrt{3}$$

$$8\sqrt{3} - 2\sqrt{27}$$

$$\sqrt{8} + 3\sqrt{2}$$

$x$	$x^2$
1	1
2	4
3	9
4	16
5	25
6	36
7	49
8	64
9	81
10	100

perfect  
squares

Using the **Product Property**

$$\sqrt{m \cdot n} = \sqrt{m} \cdot \sqrt{n}$$

Using the **Quotient Property**

$$\sqrt{\frac{m}{n}} = \frac{\sqrt{m}}{\sqrt{n}}$$

By rationalizing the denominator

$$\frac{5}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{5\sqrt{2}}{2}$$

By combining like radical terms

$$6\sqrt{2} + 4\sqrt{2} = 10\sqrt{2}$$