

## Simplifying Radicals

Date \_\_\_\_\_

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

$$11^2=121 \quad 12^2=144 \quad 13^2=169 \quad 14^2=196 \quad 15^2=225$$

Simplify (Simplifying Perfect Squares):

1.  $\sqrt{4}=2$

2.  $\sqrt{16}=4$

3.  $-\sqrt{100}=-10$

4.  $\sqrt{a^8}=a^4$

5.  $\sqrt{w^{12}}=w^6$

 $\frac{5}{12}$ 

6.  $\sqrt{a^6 b^{10}}$   
 $\sqrt{a^4} \cdot \sqrt{b^6}$   
 $a^2 b^3$

7.  $\sqrt{9a^2}$   
 $3a$

8.  $-\sqrt{81m^{64}}$   
 $-9m^{32}$

9.  $\sqrt{49a^4 b^{12}}$   
 $7a^2 b^3$

10.  $\sqrt{121x^{14}y^6}$   
 $11x^7 y^3$

Simplify (Simplifying Radicals that are not Perfect Squares):

1.  $\sqrt{20}=\sqrt{4} \cdot \sqrt{5}=2\sqrt{5}$

2.  $\sqrt{27}=\sqrt{9}\sqrt{3}=3\sqrt{3}$

3.  $\sqrt{48}=\sqrt{16}\sqrt{3}=4\sqrt{3}$

4.  $\sqrt{45}=\sqrt{9}\sqrt{5}=3\sqrt{5}$

5.  $\sqrt{12}=\sqrt{4}\sqrt{3}=2\sqrt{3}$

6.  $\sqrt{50}=\sqrt{25} \cdot \sqrt{2}=5\sqrt{2}$

7.  $\sqrt{a^5}=\sqrt{a^4} \sqrt{a}=a^2 \sqrt{a}$

8.  $\sqrt{x^9}=\sqrt{x^8} \sqrt{x}=x^4 \sqrt{x}$

9.  $\sqrt{x^3}=\sqrt{x^2} \sqrt{x}=x\sqrt{x}$

Simplify:

1.  $\sqrt{18}$

2.  $\sqrt{125}$

3.  $\sqrt{72}$

4.  $\sqrt{180}$

5.  $\sqrt{a^3}=a\sqrt{a}$

$\sqrt{9} \cdot \sqrt{2}$   
 $3\sqrt{2}$

$\sqrt{25} \cdot \sqrt{5}$   
 $5\sqrt{5}$

$\sqrt{36} \sqrt{2}$   
 $6\sqrt{2}$

$\sqrt{36} \cdot \sqrt{5}$   
 $6\sqrt{5}$

6.  $\sqrt{b^7}$

7.  $\sqrt{m^{11}}$

8.  $\sqrt{75x^7 y^5}$

9.  $\sqrt{27a^{11} b^7}$

10.  $\sqrt{32a^7 b^4}$

$\sqrt{b^6} \cdot \sqrt{b}=b^3 \sqrt{b}$

$\sqrt{m^{10}} \cdot \sqrt{m}$   
 $m^5 \sqrt{m}$

11.  $\sqrt{9a^8}$

12.  $\sqrt{45a^7}$

13.  $\sqrt{36x^2 y^6}$

14.  $\sqrt{12x^{20} y^8}$

15.  $-\sqrt{200} - \sqrt{100} \cdot \sqrt{2}$   
 $-10\sqrt{2}$

16.  $\sqrt{196}$

17.  $\sqrt{63x^4 y}$

18.  $\sqrt{6x^3}$

19.  $\sqrt{100x^5 y}$

20.  $\sqrt{80x^{100} y^{49}}$

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$$\sqrt{200} = \sqrt{25} \cdot \sqrt{8}$$

$$5\sqrt{8}$$

$$5 \cdot \sqrt{4} \cdot \sqrt{2}$$

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

$$10\sqrt{2}$$