

Algebra I

Notes 13.2, Part 1 Simplifying Radical Expressions

Objective: Simplify a radical expression containing a perfect square factor.

radical sign

$$\sqrt{\quad} \quad \text{radicand}$$

Evaluate these perfect square radicals:

$\sqrt{9} =$

$\sqrt{4} =$

$\sqrt{25} =$

$\sqrt{121} =$

$\sqrt{49} =$

Re-write each radicand as a product of prime factors.

$\sqrt{\quad} =$

$\sqrt{\quad} =$

$\sqrt{\quad} =$

$\sqrt{\quad} =$

$\sqrt{\quad} =$

Note that when **two prime factors are the same** in the radicand, the result is **one of those** prime factors outside the radicand.

A radical expression is **simplified** if the expression under the radical sign contains no perfect squares greater than 1. To help identify perfect square factors, you can re-write the radicand as the product of prime factors.

For Examples 1-4:

1. Complete a **factor tree** to identify the prime factors of the radicand.
2. **Re-write** the radicand as a **product of prime factors**.
3. Circle **pairs of factors** and **simplify**.

Example 1

Simplify $\sqrt{20}$

$$= \sqrt{\quad}$$

$$=$$

Example 2

Simplify $\sqrt{50}$

$$= \sqrt{\quad}$$

$$=$$

Example 3

Simplify $\sqrt{200}$

$$= \sqrt{\quad}$$

$$=$$

$$=$$

Example 4

Simplify $\sqrt{162}$

$$= \sqrt{\quad}$$

$$=$$

$$=$$

For Examples 5-8:

1. **Re-write** the radicand as a **product of prime factors**.
2. Circle **pairs of factors** and **simplify**.

Example 5

Simplify $\sqrt{3a^2}$

$$= \sqrt{\quad}$$

=

Example 6

Simplify $\sqrt{7b^3}$

$$= \sqrt{\quad}$$

=

Example 7

Simplify $\sqrt{9a^4}$

$$= \sqrt{\quad}$$

=

=

Example 8

Simplify $\sqrt{28ab^2}$

$$= \sqrt{\quad}$$

=

Classroom Practice

For 1-25: Re-write the radicand as a product of prime factors*; circle **pairs of factors** then **simplify** (*make factor trees as needed). **Box your final answers**.

1. $\sqrt{12}$

$$= \sqrt{\quad}$$

=

2. $\sqrt{8}$

$$= \sqrt{\quad}$$

=

3. $\sqrt{18}$

$$= \sqrt{\quad}$$

=

4. $\sqrt{27}$

$$= \sqrt{\quad}$$

=

5. $\sqrt{32}$

$$= \sqrt{\quad}$$

=

6. $\sqrt{75}$

$$= \sqrt{\quad}$$

=

7. $\sqrt{45}$

$$= \sqrt{\quad}$$

=

8. $\sqrt{80}$

$$= \sqrt{\quad}$$

=

9. $\sqrt{44}$

$$= \sqrt{\quad}$$

=

10. $\sqrt{108}$

$$= \sqrt{\quad}$$

=

11. $\sqrt{c^3}$

$$= \sqrt{\quad}$$

=

12. $\sqrt{3d^4}$

$$= \sqrt{\quad}$$

=

13. $\sqrt{a^2b^3}$

$$= \sqrt{\quad}$$

=

14. $\sqrt{7xy^2z}$

$$= \sqrt{\quad}$$

=

15. $\sqrt{160}$

$$= \sqrt{\quad}$$

=

16. $\sqrt{11c^3}$

$$= \sqrt{\quad}$$

=

17. $\sqrt{49w}$

$$= \sqrt{\quad}$$

=

18. $\sqrt{100p^4}$

$$= \sqrt{\quad}$$

=

19. $\sqrt{52xy}$

$$= \sqrt{\quad}$$

=

20. $\sqrt{144}$

$$= \sqrt{\quad}$$

=

21. $\sqrt{98x^5}$

$$= \sqrt{\quad}$$

=

22. $\sqrt{9r^3}$

$$= \sqrt{\quad}$$

=

23. $\sqrt{4d^2}$

$$= \sqrt{\quad}$$

=

24. $\sqrt{175e}$

$$= \sqrt{\quad}$$

=

25. $\sqrt{300}$

$$= \sqrt{\quad}$$

=