

Notes:

[11.4] Irrational Square Roots (Simplifying Radicals)

$$\textcircled{1} \sqrt{500} = \sqrt{100 \cdot 5} = \boxed{10\sqrt{5}}$$

What is the biggest Perfect square factor?

$$\textcircled{2} \sqrt{63} = \sqrt{9 \cdot 7} = \boxed{3\sqrt{7}}$$

$$\textcircled{3} 5\sqrt{8} = 5\sqrt{4 \cdot 2} = \boxed{10\sqrt{2}}$$

$$\textcircled{4} \sqrt{72} = \sqrt{9 \cdot 8} = \sqrt{9 \cdot 4 \cdot 2} = \boxed{6\sqrt{2}}$$

$$\textcircled{\text{or}} = \sqrt{36 \cdot 2} = \boxed{6\sqrt{2}} \leftarrow \text{same}$$

$$\textcircled{5} 7\sqrt{12} = 7\sqrt{4 \cdot 3} = \boxed{14\sqrt{3}}$$

$$\textcircled{6} \sqrt{2800} = \sqrt{100 \cdot 4 \cdot 7} = \boxed{20\sqrt{7}}$$

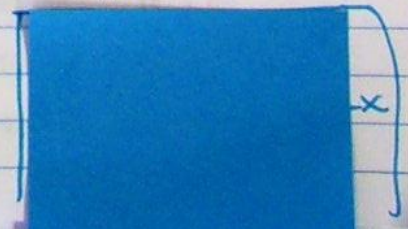
$$\textcircled{7} \sqrt{960} = \sqrt{4 \cdot 240} = \sqrt{4 \cdot 4 \cdot 60} = \sqrt{4 \cdot 4 \cdot 4 \cdot 15} = \boxed{8\sqrt{15}}$$

$$\rightarrow \sqrt{64 \cdot 15} = \boxed{8\sqrt{15}}$$

Look For...

- $\textcircled{4}$ IF Last 2 digits are divisible by 4
- $\textcircled{9}$ IF the sum of the digits is divisible by 9
- $\textcircled{25}$ IF the last 2 digits are 00, 25, 50, 75

$\textcircled{8} \sqrt{50} = \sqrt{25 \cdot 2} = \boxed{5\sqrt{2}}$	$\boxed{5\sqrt{2}}$
$\textcircled{9} \sqrt{98} = \sqrt{49 \cdot 2} = \boxed{7\sqrt{2}}$	$\boxed{7\sqrt{2}}$
$\textcircled{10} \sqrt{350} = \sqrt{25 \cdot 14} = \boxed{5\sqrt{14}}$	$\boxed{5\sqrt{14}}$
$\textcircled{11} \sqrt{128} = \sqrt{64 \cdot 2} = \boxed{8\sqrt{2}}$	$\boxed{8\sqrt{2}}$



Homework:

NAME _____ DATE _____

Irrational Square Roots

Objective: To simplify radicals and to find decimal approximations of irrational square roots.

Vocabulary

Irrational numbers Real numbers that can't be expressed in the form $\frac{a}{b}$, where a and b are integers. Their exact values can't be expressed as either terminating or repeating decimals.

Property

Property of Completeness Every decimal represents a real number, and every real number can be represented by a decimal.

Example 1 Simplify: a. $\sqrt{256}$ b. $\sqrt{50}$ c. $2\sqrt{80}$ d. $\sqrt{704}$

Solution a. $\sqrt{256} = \sqrt{4 \cdot 64}$ Factor within the radical sign.
 $= \sqrt{4} \cdot \sqrt{64}$ Use the product property of square roots.
 $= 2 \cdot 8$ Simplify.
 $= 16$

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

c. $2\sqrt{80} = 2\sqrt{16 \cdot 5}$
 $= 2 \cdot 4\sqrt{5}$
 $= 8\sqrt{5}$

d. $\sqrt{704} = \sqrt{64 \cdot 11}$
 $= 8\sqrt{11}$

Simplify.

- | | | | | |
|-------------------|------------------|-------------------|-------------------|--------------------|
| 1. $\sqrt{27}$ | 2. $\sqrt{20}$ | 3. $\sqrt{72}$ | 4. $\sqrt{32}$ | 5. $\sqrt{48}$ |
| 6. $\sqrt{45}$ | 7. $\sqrt{196}$ | 8. $\sqrt{80}$ | 9. $2\sqrt{63}$ | 10. $4\sqrt{98}$ |
| 11. $7\sqrt{28}$ | 12. $4\sqrt{40}$ | 13. $\sqrt{441}$ | 14. $\sqrt{289}$ | 15. $3\sqrt{50}$ |
| 16. $12\sqrt{50}$ | 17. $\sqrt{729}$ | 18. $\sqrt{432}$ | 19. $8\sqrt{75}$ | 20. $2\sqrt{90}$ |
| 21. $\sqrt{147}$ | 22. $\sqrt{288}$ | 23. $\sqrt{4225}$ | 24. $5\sqrt{800}$ | 25. $5\sqrt{1025}$ |

