

Name _____ Simplifying Square Roots

Perfect Squares: 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225, 256, 289, 324, 361, 400

$$\sqrt{100} = 10$$

Why are these perfect squares? $\sqrt{\quad}$ is a whole number. $10 \cdot 10 = 100$

Which of the following variables are perfect squares? Why?

$$x^2, x^7, x^{12}, x^{49}, x^{100}$$
$$\sqrt{x^2} = x$$
$$x \cdot x = x^2$$

$$\sqrt{x^{100}} = x^{50}$$
$$x^{50} \cdot x^{50} = x^{100}$$

$$\sqrt{x^{12}} = x^6$$
$$x^6 \cdot x^6 = x^{12}$$

Simplify the following square roots:

1. $\sqrt{50}$

$$\sqrt{25} \sqrt{2}$$
$$\downarrow$$
$$5\sqrt{2}$$

2. $\sqrt{90}$

$$\sqrt{9} \sqrt{10}$$
$$\downarrow$$
$$3\sqrt{10}$$

3. $\sqrt{96}$

$$\sqrt{16} \sqrt{6}$$
$$\downarrow$$
$$4\sqrt{6}$$

4. $8\sqrt{63}$

$$8\sqrt{9} \sqrt{7}$$
$$8 \cdot 3\sqrt{7}$$
$$24\sqrt{7}$$

5. $-2\sqrt{9}$

$$-2 \cdot 3$$
$$-6$$

6. $25\sqrt{200}$

$$25\sqrt{100} \sqrt{2}$$
$$25 \cdot 10\sqrt{2}$$
$$250\sqrt{2}$$

7. $\sqrt{24x^8}$

$$\sqrt{4x^8} \sqrt{6}$$
$$2x^4 \sqrt{6}$$

8. $\sqrt{8m^3}$

$$\sqrt{4m^2} \sqrt{2m}$$
$$2m\sqrt{2m}$$

9. $\sqrt{48xy^{10}z^{17}}$

$$\sqrt{16y^{10}z^{16}} \sqrt{3xz}$$
$$4y^5z^8 \sqrt{3xz}$$

Simplifying Radicals

Name _____

1. $\sqrt{48}$	2. $\sqrt{75}$	3. $\sqrt{12}$
4. $\sqrt{125}$	5. $\sqrt{20}$	6. $\sqrt{121}$
7. $\sqrt{18}$	8. $\sqrt{27}$	9. $\sqrt{32}$
10. $\sqrt{648}$	11. $\sqrt{72}$	12. $\sqrt{175}$
13. $\sqrt{80}$	14. $\sqrt{294}$	15. $\sqrt{600}$

16. $4\sqrt{8}$	17. $2\sqrt{27}$	18. $4\sqrt{320}$
19. $5\sqrt{64}$	20. $2\sqrt{150}$	21. $5\sqrt{125}$
22. $\sqrt{28x}$	23. $\sqrt{12n^2}$	24. $\sqrt{16r^3}$
25. $\sqrt{448x^7}$	26. $\sqrt{48n^4}$	27. $\sqrt{72b^2}$
28. $\sqrt{18a^5b^2c^3}$	29. $4\sqrt{20w^{10}x^9y^2}$	30. $-3\sqrt{24xy^8}$

