

Algebra I
9.6 Worksheet
Radicals and Rational Exponents

NAME: _____
DATE: _____ HOUR: _____

Complete the following sentences:

1. The “*square* root of x ” can be written as _____ or _____ .
2. The “*cube* root of x ” can be written as _____ or _____ .
3. The “*fourth* root of x ” can be written as _____ or _____ .
4. The “*fifth* root of x ” can be written as _____ or _____ .

Evaluate the following:

- | | | | |
|----------------|-------------------|----------------|---------------|
| 5. $8^{1/3}$ | 6. $1000^{1/3}$ | 7. $64^{1/3}$ | 8. $1^{1/3}$ |
| 9. $81^{1/4}$ | 10. $10000^{1/4}$ | 11. $16^{1/4}$ | 12. $1^{1/4}$ |
| 13. $16^{5/4}$ | 14. $8^{2/3}$ | 15. $16^{3/4}$ | 16. $1^{5/4}$ |

Write each expression in radical form $(\sqrt[b]{x})^a$.

- | | | | |
|---------------|---------------|---------------|---------------|
| 17. $c^{5/4}$ | 18. $d^{2/3}$ | 19. $y^{4/3}$ | 20. $f^{5/7}$ |
|---------------|---------------|---------------|---------------|

Write each expression in rational exponent form $x^{a/b}$.

- | | | | |
|-----------------------|--------------------|-----------------------|-----------------------|
| 21. $(\sqrt[3]{x})^3$ | 22. $(\sqrt{g})^6$ | 23. $(\sqrt[4]{y})^3$ | 24. $(\sqrt[3]{p})^4$ |
|-----------------------|--------------------|-----------------------|-----------------------|

25. Complete the following properties:

$$x^a \cdot x^b = \underline{\hspace{2cm}}$$

$$\frac{x^a}{x^b} = \underline{\hspace{2cm}}$$

$$(x^a)^b = \underline{\hspace{2cm}}$$

$$\left(\frac{x}{y}\right)^a = \underline{\hspace{2cm}}$$

$$x^{-a} = \underline{\hspace{2cm}}$$

$$(x y z)^a = \underline{\hspace{2cm}}$$

$$x^0 = \underline{\hspace{2cm}}$$

Simplify each expression (no negative exponents).

26. $\frac{15a^3b^3}{-5a^2b}$

30. $q^2 \cdot (q^3)^4$

27. $(-4tv^4)^3$

31. 11^0

28. $\frac{24d^3e^3}{2de^4}$

32. $(-5ab^2)^2$

29. $\frac{w^2w^3}{w^9}$

33. $(v^4)^{-3}$