Algebra 1   7.3
Evaluate and rewrite expressions involving rational
exponents
Solve equations with rational exponents
rational
inverse operation
radical sign
square root $\sqrt{49}$ $(40)^{\frac{1}{2}}$
cube root $\sqrt[3]{} \dfrac{7}{}$ $()^{\frac{1}{3}}$
nth root
exponential equation

matching activity $\sqrt[5]{}$ $()^{\frac{1}{5}}$
whiteboards

finally found the square root!

Quiz 7.1-7.2

1A. $a^{\frac{1}{2}}$

1B. $\sqrt{22}$

$$(22)^{\frac{1}{2}}$$

1C. $(7w)^{\frac{1}{2}}$

$$\sqrt{7w}$$

1D. $2\sqrt{x}$

$$2(x)^{\frac{1}{2}}$$

2A. $\sqrt[3]{64}$ $= 4$

2B. $\sqrt[4]{10,000}$ $= 10$

$(\quad)^3 = 64$

$64 \cdot 64 \cdot 64$

Dominoes activity:
Shuffle face down
Each person takes 5 dominoes. The others remain face down.
Player 1 places a domino face up on the table.
Player 2 matches either end of the domino.
    If unable to do so, draws one from the unused pile.
    If player 2 can play the domino drawn, they may do so.
Players alternate turns until all dominoes are played.

10 min.

☐ $3^x = 3^5$ ☐ $\underline{3^{2x}} = 9^{3x}$

$x = 5$ $9^{3x} \div (3^2)^{3x}$

Are the numbers equal?
Are the bases the same?
Well then....

Example 5 Solve Exponential Equations

Solve each equation.

a. $6^x = 216$

$$6^x = 6^3$$

$$x = 3$$

b. $25^{x-1} = 5$

$$\left(5^2\right)^{x-1} = 5^1$$

$$5^{2x-2} = 5^1$$

Hint: can both sides be written using the same base?
(If the numbers are equal, and the bases are the same...)

$$2x - 2 \overset{?}{=} 1$$
$$+2 \quad +2$$
$$\overline{2x = 4}$$

$$x = 2$$

GuidedPractice

5A. $5^x = 125$

$$5^x = 5^3$$

$$x = 3$$

5B. $12^{2x + 3} = 144$

$$12^{2x+3} = 12^2$$

$$2x + 3 = 2$$
$$-3 \quad -3$$
$$\frac{2x}{2} = \frac{-1}{2}$$
$$x = -\frac{1}{2}$$

Solve each equation.

$x = 3$

79. $2^{5x} = 8^{2x-4}$

$$2^{5x} = \left(2^{\bullet 3}\right)^{2x-4}$$

$$2^{5x} = 2^{6x-12}$$

$$5x = 6x - 12$$

$$+12 - 5x \quad -5x + 12$$

$$12 = x$$

80. $81^{2x-3} = 9^{x+3}$

$$\left(9^2\right)^{2x-3} = 9^{x+3}$$

$$9^{4x-6} = 9^{x+3}$$

$$4x - 6 = x + 3$$

$$-x + 6 \quad -x + 6$$

$$3x = 9$$

82. $16^x = \frac{1}{2}.$

$(2^4)^x = 2^{-1}$

$2^{4x} = 2^{-1}$

$\frac{4x}{4} = \frac{-1}{4}$

$x = -\frac{1}{4}$

83. $25^x = \frac{1}{125}$

$\frac{1}{5^3}$

$(5^2)^x = 5^{-3}$

$5^{2x} = 5^{-3}$

$\frac{2x}{2} = \frac{-3}{2}$

$x = \frac{-3}{2}$

7. 3 WB prae.

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