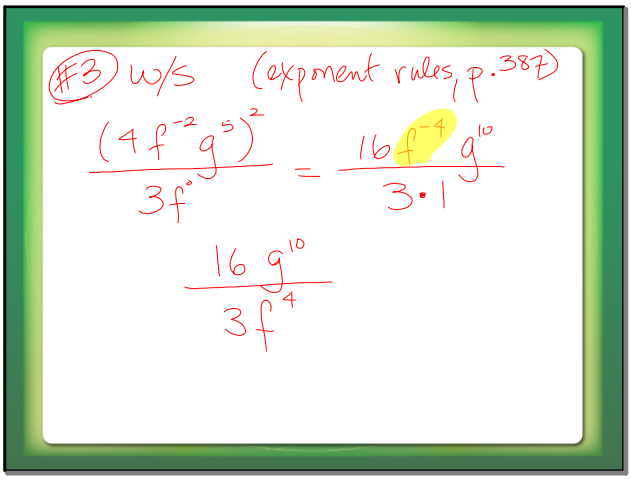

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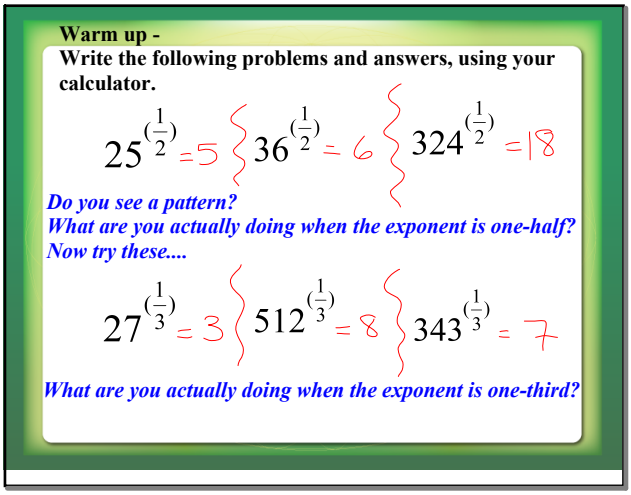

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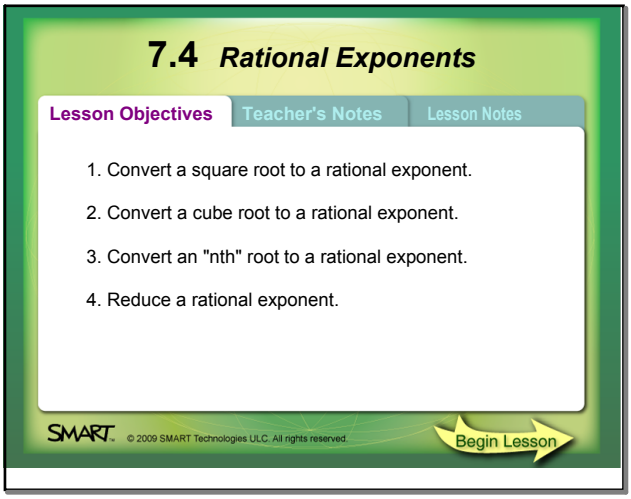


Objectives

Square Roots

Pull for Hint

A square root is equivalent to an exponent of one-half.

$\sqrt[2]{x^1} = x^{\frac{1}{2}}$ (1 = exponent, 2 = index)

Why? _____

Erase the blue oval to check your explanation.

Square Roots

Cube roots

Pull for Directions

What exponent is equivalent to a cube root?

$\sqrt[3]{x} = x^{-}$

Answer and explain.

_____

Cube Roots

Converting Practice

Write using rational exponents.

$x^{\frac{3}{2}}$ ___ $\sqrt{x^3}$

$x^{\frac{2}{3}}$ ___ $\sqrt[3]{x^2}$

$x^{\frac{4}{3}}$ ___ $\sqrt[3]{x^4}$

$\sqrt{x^5}$ ___ $x^{\frac{5}{2}}$

Press tiles to reveal solutions.

Converting Practice

Write using rational exponents.

$\sqrt[3]{(4m)^6} = (4m)^{\frac{6}{3}} = (4m)^2$

$= 16m^2$

Converting Practice

Pull for Teacher's Notes

nth Roots

What exponent is equivalent to an nth root?

$\sqrt[n]{x^m} = x^{\frac{m}{n}}$

Answer and explain.

Use the magnifying glass to reveal the answer.

nth Roots

Challenge

Write these in radical form.
Then click each tile to check your answers.

$x^{3/2}$ $x^{4/5}$ $x^{2/3}$

Challenge

Challenge

Let's look at the last problem.

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

What if the exponent were negative?

$$\frac{1}{x^{2/3}}$$

Challenge

Examples

Pull for Hint

Simplify.

1) $27^{\frac{1}{3}}$ → 3

2) $3^{\frac{1}{2}} \cdot 12^{\frac{1}{2}}$ → $\sqrt{3} \cdot \sqrt{12}$ → $\sqrt{36}$ → 6

3) $8^{\frac{2}{3}}$ → $\left(2^{\frac{3}{1}}\right)^{\frac{2}{3}}$ → $2^2 = 4$

Square Roots

Examples

Pull for Hint

Simplify.

4) $16^{1.5}$ → $(16)^{3/2}$ → $(2^4)^{3/2} = 2^6 = 64$

5) $25^{\frac{-3}{2}}$ → $\left(5^{\frac{2}{1}}\right)^{-\frac{3}{2}}$ → $= 5^{-3}$ → $= \frac{1}{5^3}$ → $= \frac{1}{125}$

6) $(8x^{15})^{\frac{-1}{3}}$ → $\left(2^3 x^{15}\right)^{-\frac{1}{3}}$ → $2^{3 \cdot -\frac{1}{3}} \cdot x^{15 \cdot -\frac{1}{3}}$ → $2^{-1} x^{-5}$ → $\frac{1}{2x^5}$

Square Roots

Challenge

7) Simplify competely.

$$\left(\frac{x^{\frac{1}{4}}}{y^{\frac{-5}{6}}}\right)^{12} = \frac{x^3}{y^{-10}}$$

$$\frac{x^3 y^{10}}{1}$$

Challenge

HW 7.4
p. 388 #1-25 odd, #31-35 odd and #39-49 odd

End of Lesson

Simplify each expression.

1. $36^{\frac{1}{2}}$
2. $27^{\frac{1}{3}}$
3. $49^{\frac{1}{2}}$
4. $10^{\frac{1}{2}} \cdot 10^{\frac{1}{2}}$
5. $(-3)^{\frac{1}{3}} \cdot (-3)^{\frac{1}{3}} \cdot (-3)^{\frac{1}{3}}$
6. $3^{\frac{1}{2}} \cdot 12^{\frac{1}{2}}$
7. $2^{\frac{1}{2}} \cdot 32^{\frac{1}{2}}$
8. $3^{\frac{1}{3}} \cdot 9^{\frac{1}{3}}$
9. $3^{\frac{1}{4}} \cdot 27^{\frac{1}{4}}$

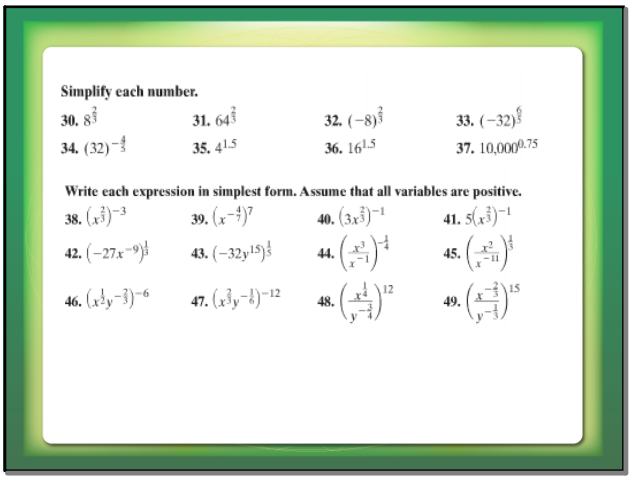
Write each expression in radical form.

10. $x^{\frac{1}{6}}$
11. $x^{\frac{1}{3}}$
12. $x^{\frac{2}{3}}$
13. $y^{\frac{2}{5}}$
14. $y^{-\frac{9}{8}}$
15. $t^{-\frac{3}{4}}$
16. $x^{1.5}$
17. $y^{1.2}$

Write each expression in exponential form.

18. $\sqrt{-10}$
19. $\sqrt{7x^3}$
20. $\sqrt{(7x)^3}$
21. $(\sqrt{7x})^3$
22. $\sqrt[3]{a^2}$
23. $(\sqrt[3]{a})^2$
24. $\sqrt[4]{c^2}$
25. $\sqrt[3]{(5xy)^6}$

Dec 3-3:08 PM



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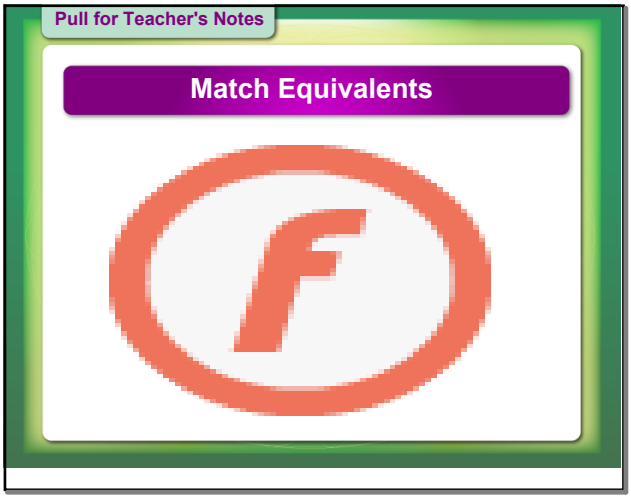
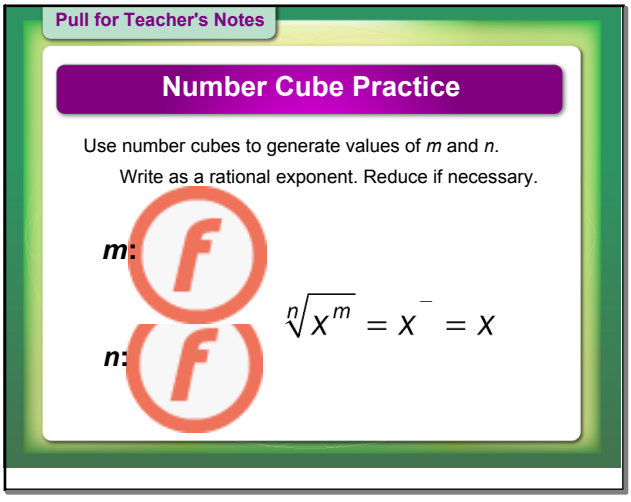
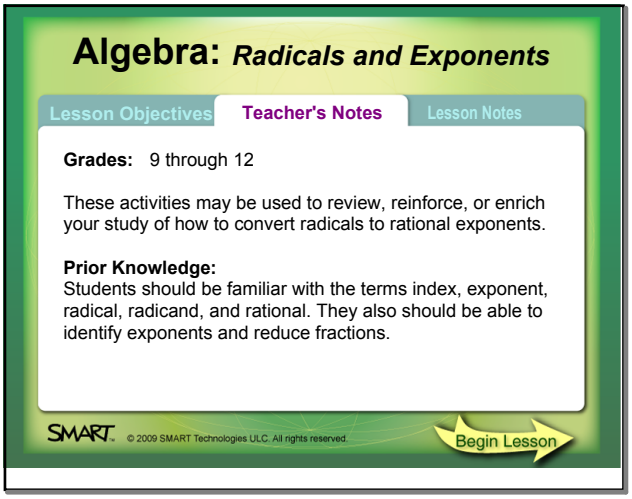


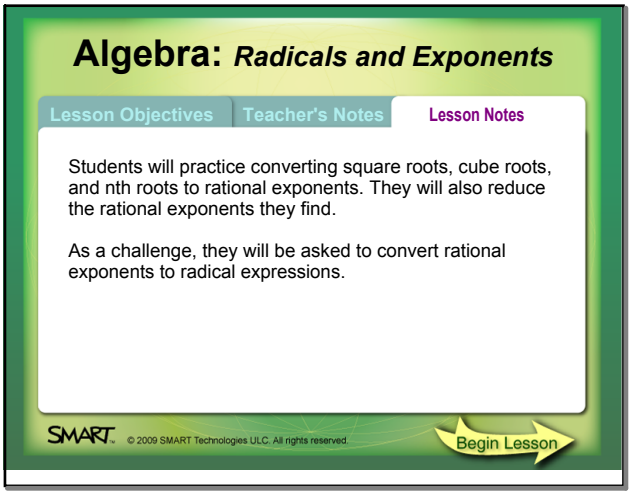
Match Equivalents



Number Cube Practice



Teacher Notes



Lesson Notes

Jan 24-10:50 AM