

# 7.3A Guided Notes

M-Review  
T-Test

What is a Radical?



$$\sqrt[n]{x} = x^{\frac{1}{n}}$$

$$\sqrt[7]{x^6} = x^{\frac{6}{7}}$$

## Converting Rational Exponents to Radicals:

$$125^{\frac{1}{3}} = \sqrt[3]{125} = \sqrt[3]{125}$$

$$8^{\frac{2}{3}} = \sqrt[3]{8^2}$$

$$(3x)^{\frac{1}{2}} = \sqrt{3x} = \sqrt{3x}$$

$$5x^{\frac{7}{2}} = 5\sqrt{x^7} = 5\sqrt{x^7}$$

## Converting Radicals to Rational Exponents:

$$\sqrt[3]{49} = 49^{\frac{1}{3}}$$

$$\sqrt[5]{32^2} = 32^{\frac{2}{5}}$$

$$\sqrt[3]{16abc} = (16abc)^{\frac{1}{3}}$$

$$15\sqrt[3]{xy} = 15(xy)^{\frac{1}{3}} \quad 4\sqrt[5]{5x} = 4(5x)^{\frac{1}{5}}$$

## Evaluating Exponential Expressions:

Use the Calculator to Evaluate

$$1296^{\frac{1}{4}} = 6$$

$$36^{\frac{3}{2}} = 216$$

$$\left(\frac{1}{9}\right)^{\frac{1}{2}} = \frac{1}{3}$$

$$\sqrt[4]{\frac{81}{625}} = .6 \text{ or } \frac{3}{5}$$

$$\sqrt[3]{27^2} = 9$$

$$9$$

$$\sqrt[4]{256^5} = 1024$$

$$1024$$

(119) ^ (112) MATH Enter Enter

Solving Exponential Equations:

RULE: If the bases are the same, then the exponents must be EQUAL!!

$$2^x = 2^9$$

$$x = 9$$

$$2^9 = 2^9$$

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

$$3^{8-3} = 3^5 = 3^5 \checkmark$$

$$x - 3 = 5$$

$$+3 \quad +3$$

$$x = 8$$

What if the bases aren't the same????

Step 1: Write a same base with a box as an exponent

Step 2: Guess and check in your calculator!

$$3^x = 81$$

$$3^x = 3^4$$

$$x = 4$$

$$6^{x-1} = 1296$$

$$6^{x-1} = 6^4$$

$$x - 1 = 4$$

$$+1 \quad +1$$

$$x = 5$$

$$2^{4x+3} = 2048$$

$$2^{4x+3} = 2^{11}$$

$$4x + 3 = 11$$

$$-3 \quad -3$$

$$4x = 8$$

$$\frac{4x}{4} = \frac{8}{4}$$

$$x = 2$$

Piggyback  
 $(x^3)^5 = x^{15}$   
 $(6^2)^x = 6^{2x}$

What if the base is bigger than the other side?

$$36^x = 6$$

$$(6^2)^x = 6^1$$

$$6^{2x} = 6^1$$

$$\frac{2x}{2} = \frac{1}{2}$$

$$x = \frac{1}{2}$$

$$64^x = 4$$

$$(4^3)^x = 4^1$$

$$4^{3x} = 4^1$$

$$\frac{3x}{3} = \frac{1}{3}$$

$$x = \frac{1}{3}$$

$$16^x = 2$$

$$(2^4)^x = 2$$

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

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

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

Homework Problems: