$$4.3$$
 $4.8$ 
 $64.3 \times 64$ 
 $4.3 \times 64$ 
 $= 4.3 \times 64$ 

$$64\sqrt{3} \times 6^{9}$$

$$47 = 6$$

$$= \sqrt{18}$$

$$\sqrt{69} = 6$$

$$= \sqrt{3} \times 1296$$

$$= \sqrt{3} \times 129$$

## 4.4 Rational Exponents and Radicals

Recall:

$$(x^a)(x^b) = \chi \qquad \qquad (x^a)^b = \chi \qquad \qquad (x^a)^b = \chi$$

$$(x^a) = \chi$$

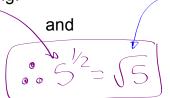
$$(x^a)^b = \chi$$

Consider the following:

$$(5^{1/2})(5^{1/2})$$

$$= 5^{1/2} + 1/2$$

$$= 5^{2/2} = 5^{1/2}$$



$$(5^{1/2})(5^{1/2}) \qquad \text{and} \qquad (\sqrt{5})(\sqrt{5}) = \sqrt{5} - 5$$

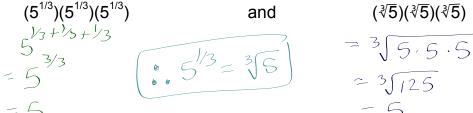
$$= 5^{1/2} + \sqrt{2}$$

$$= 5^{1/2} = 5$$

$$= 5^{1/2} = 5$$

$$= 5$$

Similarly:



$$(\sqrt[3]{5})(\sqrt[3]{5})$$
=  $3\sqrt{5.5.5}$ 
=  $3\sqrt{125}$ 
= 5

\* If *n* is a natural number and *x* is a rational number then

$$\chi^{\nu_n} = \sqrt[n]{\chi}$$

$$=\sqrt{16}$$
  $=\sqrt{3}-64$   $=\sqrt{3}$   $=\sqrt{4}$   $=\sqrt{4}$   $=\sqrt{4}$   $=\sqrt{4}$ 

$$= 5\sqrt{32}$$
$$= 7$$

\* And if the numerator of the exponent is not 1 ....

ex. 
$$16^{3/4} = (16^{1/4})^3$$

$$= (416)^3$$

$$= (416)^3$$

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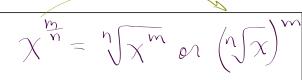
$$= (416)^3$$

$$= (416)^3$$

$$= (416)^3$$

$$= (4$$







## ex. Express as a power

$$= 5^{2/3}$$

b) 
$$(\sqrt[4]{7})^3$$

$$=7^{3/4}$$

ex. Express as a radical, then evaluate find the value of

$$= \sqrt{35^{2}}$$

$$(35)^{2} = 6.08$$

b) 
$$(-27)^{4/3}$$

$$= 3\sqrt{(27)^{4/3}}$$

$$= (-3)^{4/3}$$

c) 
$$(0.01)^{3/2}$$

$$= \left(\frac{1}{100}\right)^{3/2}$$

$$= \frac{1}{(100)^{3/2}}$$

$$= \frac{1}{(100)^3}$$

d) 
$$(0.75)^{1.2}$$

$$= \left(\frac{3}{4}\right)^{6/5}$$

$$= \left(5\sqrt{\frac{3}{4}}\right)^{6}$$

$$= 0.71$$

homefun: pg. 227 #3, 4, 6-12, 16-19