

# Rational Exponents & Radicals (Section 1-4)

\* Rational exponents represent radicals:  $a^{n/m} = \sqrt[m]{a^n}$

index  
exponent  
radicand

\* The index gives you the degree of the root. If no index is given, it is assumed its a 2 (square root)

Three similar items.

ex:  $\sqrt[3]{125} = 5$

25 5  
5 5 5

ex:  $\sqrt[5]{32} = 2$

16 2  
4 4  
2 2 2 2

ex:  $\sqrt[4]{81} = 3$

9 9  
3 3 3 3

ex:  $5x^{1/3}$  express as a radical.

$= 5\sqrt[3]{x}$

ex:  $(24c)^{2/3} = \sqrt[3]{24^2 c^2} = 2 \cdot 2\sqrt[3]{9c^2} = 4\sqrt[3]{9c^2}$

24 24  
4 6 4 6  
2 2 2 3

ex:  $\sqrt[3]{s^2}$  express in exponential form.

$= s^{2/3}$

ex:  $\sqrt[4]{256a^8} = 256^{1/4} a^{8/4} = 4a^2$

\*  $256 = 4 \cdot 4 \cdot 4 \cdot 4$   
 $a^8 = a^2 \cdot a^2 \cdot a^2 \cdot a^2$

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ex:  $C = 120\sqrt[3]{n^2} + 1300$

C: cost in dollars

n: # of chips

How much to produce 250 chips?

$C = 120\sqrt[3]{(250)^2} + 1300$  \* Use Calc!

$C = 6062.20$

ex:  $\sqrt{(2c)^4} = (2c)^{4/2} = (2c)^2 = 2^2 \cdot c^2 = 4c^2$