

SECTION 8-2

# n<sup>th</sup> Roots

COMMIT TO MEMORY!!!

Square roots that come out even:

$\sqrt{1} = 1$	$\sqrt{36} = 6$
$\sqrt{4} = 2$	$\sqrt{49} = 7$
$\sqrt{9} = 3$	$\sqrt{64} = 8$
$\sqrt{16} = 4$	$\sqrt{81} = 9$
$\sqrt{25} = 5$	$\sqrt{100} = 10$

Cubed roots that come out even:

$\sqrt[3]{1} = 1$	$\sqrt[3]{64} = 4$
$\sqrt[3]{8} = 2$	$\sqrt[3]{125} = 5$
$\sqrt[3]{27} = 3$	

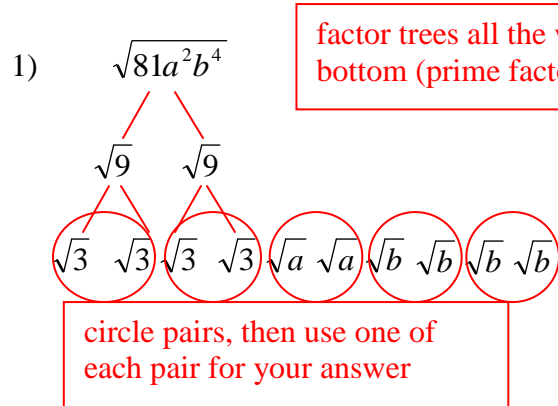
USE OF THE ABSOLUTE VALUE IN AN n<sup>th</sup>-ROOT ANSWER

Example:  $\sqrt{144x^6} = 12|x^3|$

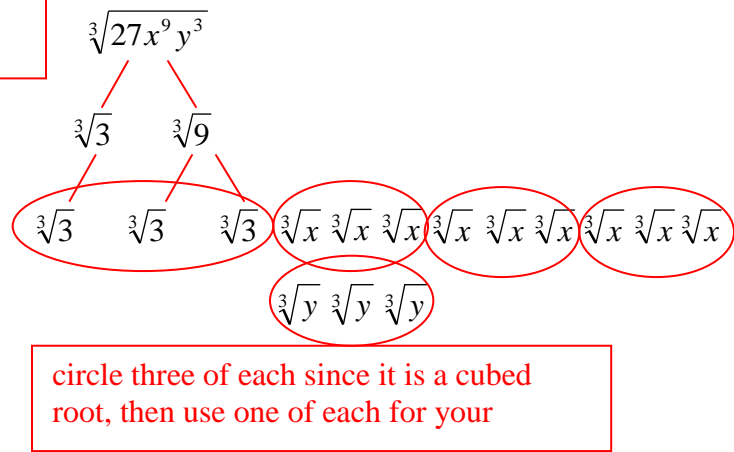
**WHY???**

we do not know whether the x was positive or negative to start with. Unless otherwise indicated a square root is assumed to be a positive answer so we must force the x<sup>3</sup> in the answer to be positive by including the absolute value

EXAMPLES (McConnell Method)



$= 3 \cdot 3 \cdot a \cdot b \cdot b$   
 $= 9ab^2$



$= 3 \cdot x \cdot x \cdot x \cdot y$   
 $= 3x^3y$

EXAMPLES (Short-cut Method)

$$3) \quad \sqrt{49n^{10}p^6}$$

$$= \sqrt[2]{49n^{10}p^6}$$

square root of 49 = 7, divide  
the exponents by the root no.

$$= 7n^5p^3$$

$$4) \quad \sqrt[3]{125d^{27}}$$

cubed root of 125 = 5, divide  
the exponents by the root no.

$$= 5d^9$$

$$5) \quad \sqrt[3]{-8}$$

$$= -2$$

$$6) \quad \sqrt[3]{-64(hj)^3k^{12}}$$

$$= -4(hj)^1k^4$$

$$= -4hjk^4$$

$$7) \quad -\sqrt{36w^8}$$

$$= (-1) \cdot 6w^4$$

$$= -6w^4$$

$$8) \quad \sqrt[4]{x^8y^{16}z^4}$$

$$= x^2y^4z$$

$$9) \quad \sqrt{\frac{9}{100}}$$

$$= \frac{\sqrt{9}}{\sqrt{100}}$$

$$= \frac{3}{10}$$

$$10) \quad \sqrt[3]{\frac{1}{27}}$$

$$= \frac{\sqrt[3]{1}}{\sqrt[3]{27}}$$

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

$$11) \quad -\sqrt[4]{(-9)^2}$$

$$= (-1)\sqrt[4]{81}$$

$$= -3$$