2.7: Find Square Roots and Compare Real Numbers Goals: *Find square roots of perfect squares *Estimate square roots of non-perfect squares					
Square root: one of two	equal factors of a n	umber			
= " Radical " s	sign **IT TALKS!!**				
It asks the question:					
"WHAT <u>number</u>	TIMESitself	ISthe number inside	?"		
Evaluate the given express	ion:				
Ex: $\sqrt{16}$	Ex: $\sqrt{64}$	Ex:	$\sqrt{81}$		
4	8		9		
Ex: $\sqrt{100}$	Ex: $\sqrt{121}$	Ex:	$\sqrt{49}$		
10	11		7		
Perfect squares: a number w	hose <u>square</u> root is	an <u>integer</u>			
1, _4, _9, _16, _	25,36, _49, _64	, _81, _100, _121	, 144, 169,		
_196, _225					
Estimate Square Roots:		Ex: $\sqrt{40}$			
1. Find the two closest One above and one below	perfectsquares	$\begin{array}{cccc} \sqrt{36} & \sqrt{40} & \sqrt{49} \\ 6 & \sqrt{40} & 7 \end{array}$			
2. Put the numbers in order f	rom <u>least</u> to				
greatest					

- 3. Find the _____square _____of the two

 _____perfect _____squares _____.
- 4. Pick the <u>closer</u> one.

Estimate the following square roots:

Ex: $\sqrt{110}$	Ex: $\sqrt{20}$
$\sqrt{100}\sqrt{110}\sqrt{121}$	$\sqrt{16}\sqrt{20}\sqrt{25}$
10 11	4 5
Closer to 10	Closer to 4

Ex: $-\sqrt{38}$	Ex: $\sqrt{8}$
$-\sqrt{49} - \sqrt{39} - \sqrt{36}$	$\sqrt{4}\sqrt{8}\sqrt{9}$
$-7 -\sqrt{39} -6$	2 3

Evaluate the expression for the given value of *x*:

Ex:
$$11 - \sqrt{x}$$
 when $x = 81$
 Ex: $6\sqrt{x} + 3$ when $x = 100$
 $11 - \sqrt{81}$
 $6\sqrt{100} + 3$
 $11 - 9$
 $6\cdot 10 + 3$
 2
 $60 + 3$
 63

QUESTION

What number times itself would be 9? ____3___

Is there any other number times itself that could be $9? _-3$ ____

All numbers have2 s	quare roots. One is <u>positive</u> a	and one is <u>negative</u> .
Ex: $\sqrt{25}$	Ex: $-\sqrt{25}$	Ex: $\pm \sqrt{25}$
5	-5	<u>±</u> 5

QUESTION

What number times itself would be -16? _____ There isn't one_____

Prove it by multiplying that number by itself. _____ x _____ Did you get -16?

Nothing times itself will ever be negative. If a number is positive, then positive times a positive is a positive.

If a number is negative, then a negative times a negative is also positive.

Extension:

If \sqrt{x} means to find the square root (the number times itself) that equals x, what do you think $\sqrt[3]{x}$ means?

<u>**Cube root**</u> - The number times itself three times.

Evaluate:

Ex: $\sqrt[3]{8}$	Ex: $\sqrt[3]{27}$	Ex: $\sqrt[3]{64}$	
2	3		
Proof: $2 \cdot 2 \cdot 2 = 8$	Proof: $3 \cdot 3 \cdot 3 = 27$	Proof: $4 \cdot 4 \cdot 4 = 64$	