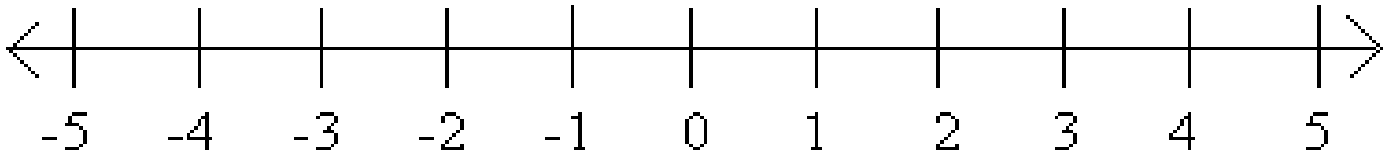
Pre-Algebra

Essential Question: How do we evaluate square roots?

Do Now: Consider the real numbers listed below. Place each number on the number line. Be ready to justify how you made your decision.

-2 $\quad 1.5 \quad$ 0.3 $\quad -\sqrt{25} \quad$ $-\pi$ $\quad \sqrt{11}$



Squares and Square Roots

Perfect square numbers represent the product of an integer multiplied by itself.

Squares of numbers

$1^2 = 1$	$6^2 = 36$	$11^2 = 121$
$2^2 = 4$	$7^2 = 49$	$12^2 = 144$
$3^2 = 9$	$8^2 = 64$	$13^2 = 169$
$4^2 = 16$	$9^2 = 81$	$14^2 = 196$
$5^2 = 25$	$10^2 = 100$	$15^2 = 225$

Square roots of numbers

$\sqrt{1} = 1$	$\sqrt{36} = 6$	$\sqrt{121} = 11$
$\sqrt{4} = 2$	$\sqrt{49} = 7$	$\sqrt{144} = 12$
$\sqrt{9} = 3$	$\sqrt{64} = 8$	$\sqrt{169} = 13$
$\sqrt{16} = 4$	$\sqrt{81} = 9$	$\sqrt{196} = 14$
$\sqrt{25} = 5$	$\sqrt{100} = 10$	$\sqrt{225} = 15$

Think about this….

1) Taking the square root of a perfect square is easy. $\sqrt{16}$ = _____ because _____ = 16

2) How do we take the square root of a "non-perfect" square number?

Estimating Square Roots

Let's consider $\sqrt{11}$ from the Do Now.

Between which two perfect squares is $\sqrt{11}$ located?

Which one is the $\sqrt{11}$ closer to?

Conclusion:_____

_____

Calculator Check:_____

Evaluate each of the following square root expressions (*estimate to the nearest integer when necessary*). Treat square roots like parentheses in the order of operations – always evaluate them first!

1) $\sqrt{9}$

2) $-\sqrt{9}$

3) $-\sqrt{49}$

4) $\sqrt{5}$

5) $\sqrt{21}$

6) $-\sqrt{92}$

7) $\sqrt{81} \times \sqrt{121}$

8) $\sqrt{169} + \sqrt{36}$

Turn and Talk 

9) Is $\sqrt{25} + \sqrt{4}$ equivalent to $\sqrt{25 + 4}$? Justify your response.

10) Is $\sqrt{25} - \sqrt{4}$ equivalent to $\sqrt{25 - 4}$? Justify your response.

11) Is $\sqrt{25} \cdot \sqrt{4}$ equivalent to $\sqrt{25 \cdot 4}$? Justify your response.

12) Is $\sqrt{25} \div \sqrt{4}$ equivalent to $\sqrt{25 \div 4}$? Justify your response.

When we take the square root of a ***perfect square*** number, the result is always

_____but when we take the square root of a

non-perfect square number, the result is always _____.

In this case we can only estimate the root because it is a nonterminating, nonrepeating decimal.

HW # _____

1. Evaluate each of the following square root expressions. *Estimate to the nearest integer when necessary*.

a. $\sqrt{100}$ b. $-\sqrt{4}$ c. $\sqrt{79}$ d. $-\sqrt{30}$

e. $\sqrt{16} \cdot \sqrt{144}$ f. $\sqrt{9} + \sqrt{49}$ g. $\sqrt{64} - \sqrt{9}$ h. $\sqrt{81} \div \sqrt{81}$

2. Without estimating, evaluate the expression: $\sqrt{8} \cdot \sqrt{2}$
   Hint: *Review #11 from today's notes.*