Name _____ Date _____

Mrs. Roumbos Period _____

Estimating the Value of Expressions

To estimate the value of an expression with an irrational number, substitute the irrational number with its approximate decimal value, the **nearest hundredth**. Then continue to solve the expression according to the order of operations.

The following table lists 9 common irrational numbers, with their decimal approximations to the hundredths.

Irrational Number	Approximation
$\sqrt{2}$	1.41
$\sqrt{3}$	1.73
$\sqrt{5}$	2.24
$\sqrt{6}$	2.45
$\sqrt{7}$	2.65

Irrational Number	Approximation
$\sqrt{8}$	2.83
π	3.14
$\sqrt{10}$	3.16
$\sqrt{11}$	3.32

- **Example**

  Approximate $\sqrt{3} + \sqrt{6}$

  The approximate value of $\sqrt{3}$ is 1.73. The approximate value of $\sqrt{6}$ is 2.45.

  1.73 + 2.45 = 4.18

  Therefore, $\sqrt{3} + \sqrt{6} \approx 4.18$

- **Example**

  Approximate π^2

  The approximate value of π is 3.14.

  $3.14^2 = 3.14 \times 3.14 = 9.8596$

  Therefore, $\pi^2 \approx 9.86$

Practice

Directions: For questions 1 through 8, find the approximate values of the given expressions, to the nearest hundredth.

1. $\pi - \sqrt{20}$	5. $10\sqrt{6} - 4\sqrt{3}$
2. $\sqrt{3} - \sqrt{2}$	6. $\sqrt{11} - \sqrt{10}$
3. $\sqrt{8} \cdot \pi$	7. $\sqrt{7} \cdot \frac{2}{5}$
4. $\sqrt{5} + \sqrt{6} + \sqrt{7}$	8. $\sqrt{2} + \sqrt{10} \cdot \pi$

9. The length of the diagonal in quadrilateral A is $5\sqrt{3}$. The length of the diagonal in quadrilateral B is $8\sqrt{2}$. The length of the diagonal in quadrilateral C is $3\sqrt{12}$. What is the approximate sum of the lengths of the diagonals of quadrilaterals A, B, and C?