PROBLEM SET – Operations with Square Roots, Mr. Peralta, Class 821 and 829

Important Problems
TASK 1: Use your calculator to complete the blanks

1. $\sqrt{5} + \sqrt{15}$ is **not** equal to $\sqrt{20}$ because… $\sqrt{5}$ is equal to _____ (round to nearest hundredth) $\sqrt{15}$ is equal to _____ (round to nearest hundredth) $\sqrt{5} + \sqrt{15}$ is equal to _____ BUT $\sqrt{20}$ is equal to _____	2. $\sqrt{20} - \sqrt{5}$ is **not** equal to $\sqrt{15}$ because… $\sqrt{20}$ is equal to _____ (round to nearest hundredth) $\sqrt{5}$ is equal to _____ (round to nearest hundredth) $\sqrt{20} - \sqrt{5}$ is equal to _____ BUT $\sqrt{15}$ is equal to _____
3. $\sqrt{20} + \sqrt{20}$ is **not** equal to $\sqrt{40}$ because ... $\sqrt{20}$ is equal to _____ (round to nearest hundredth) $\sqrt{20} + \sqrt{20}$ is equal to _____ BUT $\sqrt{40}$ is equal to _____	4. $\sqrt{5} \times \sqrt{3}$ **is** equal to $\sqrt{15}$ because… $\sqrt{5}$ is equal to _____ (round to nearest hundredth) $\sqrt{3}$ is equal to _____ (round to nearest hundredth) $\sqrt{5} \times \sqrt{3}$ is equal to _____ AND $\sqrt{15}$ is equal to _____

TASK 2: Find the *exact* value of each multiplication problem. Then state if the answer is **rational** or **irrational**

1. (**Example**) $\sqrt{8} \times \sqrt{6} = \sqrt{48}$ Irrational because it cannot be written as a fraction	2. $\sqrt{3} \times \sqrt{9} =$	3. $\sqrt{10} \times \sqrt{2} =$
4. $2\sqrt{7} \times 3\sqrt{5} =$	5. $5\sqrt{9} \times 8\sqrt{4} =$	6. $\sqrt{6} \times \sqrt{6} =$
7. $5\sqrt{32} \times 2\sqrt{2} =$	8. $2\sqrt{7} \times 3\sqrt{5} =$	9. $7\sqrt{5} \times \sqrt{20} =$

TASK 3: Summary

Adding and Subtracting Square Roots $$\sqrt{a} + \sqrt{b} \text{ (is/is not) equal to } \sqrt{a+b}$$
Multiplying and Dividing Square Roots $$\sqrt{a} \times \sqrt{b} \text{ (is/is not) equal to } \sqrt{ab}$$

TASK 4: State the exact solution to each of the equations and whether the solution is *rational* or *irrational*

1. $x^2 - 8 = 18$	2. $20 = -5 + x^2$	3. $4 - x^2 = -12$
4. $x^2 = \frac{1}{9}$	5. $x^2 - 1 = 49$	6. $3x^2 = 27$

Extension Activity

Directions: Using only numbers 1-9 (without repeating any number), fill in the boxes to create the following number types:

$$\sqrt{\boxed{}} \;+\; \frac{\boxed{}}{\boxed{}}$$ **Produces a number that can be classified as a Rational Number**

$$\sqrt{\boxed{}} \;+\; \frac{\boxed{}}{\boxed{}}$$ **Produces a number that can be classified as an Irrational Number**

$$\sqrt{\boxed{}} \;*\; \frac{\boxed{}}{\boxed{}}$$ **Produces a number that can be classified as an Irrational Number**