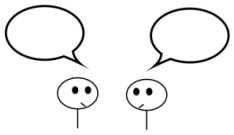
Unit 1 – The Real Number System

Let's work together. 

1. Given the numerical expressions: $-\frac{\sqrt{36}}{11}$ $42.1\overline{6}$ $\left(\sqrt{2}\right)\left(\sqrt{32}\right)$

   Identify the expression(s) that represent a rational number. Justify your response.

2. Determine if each radical expression is rational or irrational. If rational, find the integer value that is equivalent to the radical expression.

   a) $\sqrt{50}$ b) $\sqrt[3]{512}$ c) $\sqrt[3]{-8}$ d) $\sqrt{196}$ e) $\sqrt[3]{15}$

3. Rewrite the following irrational expressions in simplest radical form.

   a) $\sqrt{75}$ b) $\sqrt{48}$ c) $\sqrt{72}$

4. Provide two examples to show that the sum of two irrational numbers could be irrational or rational.

Rational Sum = _____

Irrational Sum = _____

5. Provide two examples to show that the product of two irrational numbers could be irrational or rational.

Rational Product = _____

Irrational Product = _____

6. Let ***a*** represent a non-zero rational number and let ***b*** represent an irrational number. Which expression could represent a rational number? Explain your reasoning.

   (1) $-b$ (2) $a + b$ (3) ab (4) b^2

   Explanation:

7. Fill in the real number property below that justifies each step in combining the binomials.

   Given: $(4x + 5) + (3x + 6)$

   $4x + (5 + 3x) + 6$ _____

   $4x + (3x + 5) + 6$ _____

   $(4x + 3x) + (5 + 6)$ _____

   $x(4 + 3) + (5 + 6)$ _____

   $7x + 11$

8. The following is a proof of the algebraic equivalency of $(ab)^2$ and a^2b^2. Fill in each of the blanks with either the statement "commutative property" or "associative property".

   $(ab)^2 = (ab)(ab)$

   $= a(ba)b$ _____

   $=a(ab)b$ _____

   $= (aa)(bb)$ _____

   $= a^2b^2$