

Essential Question: What types of numbers result from adding rational and irrational numbers?

Do Now:

1) Add the following pairs of rational numbers.

a) $-4 + 15$

b) $\frac{2}{3} + \frac{5}{9}$

c) $6 + 19.\bar{3}$

d) $-\sqrt{49} + \sqrt{121}$

e) $\sqrt[3]{8} + \frac{1}{2}$

f) $-0.75 + \frac{3}{4}$

2) Consider the results. Are any of the sums irrational numbers?

Adding Rational Numbers

The **sum of two rational numbers** will always be a _____ number.

Adding Irrational Numbers



How do we add irrational numbers?

a) $\pi + \pi$

b) $\sqrt{2} + \sqrt{2}$

c) $\sqrt{2} + \sqrt{3}$

d) $\pi + (-\pi)$

e) $\sqrt{2} + (-\sqrt{2})$

The **sum of two irrational numbers** may result in an _____ number or a _____ number.

Remember: When adding radical expressions, the radicands must be the same in order to combine the terms.

Examples: a) $\sqrt{5} + 3\sqrt{5} = 4\sqrt{5}$

b) $2\sqrt{7} + 9\sqrt{7} = 11\sqrt{7}$

c) $\sqrt{5} + 2\sqrt{7} = \sqrt{5} + 2\sqrt{7}$
cannot combine terms

Adding Rational and Irrational Numbers

Find the following sums.

a) $2 + \sqrt{5}$

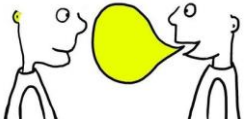
b) $3 + \pi$

c) $-\sqrt{17} + 0$

d) $\sqrt{25} + \sqrt{54}$

The **sum** of a **rational number** and an **irrational number** will always be an _____ number.

Turn and Talk



Multiple Choice:

1. For which values of N and Q is $N + Q$ a rational number?

(1) $N = \sqrt{10}$, $Q = \sqrt[3]{1}$

(3) $N = \frac{1}{\sqrt{16}}$, $Q = \frac{\sqrt{36}}{7}$

(2) $N = \sqrt{24}$, $Q = \sqrt{60}$

(4) $N = \sqrt[3]{27}$, $Q = \sqrt{10}$

Extended Response:

2. Ms. Fonseca asked her class "Is the sum of $2\sqrt{10}$ and $-\sqrt{40}$ rational or irrational?" Nathan answered that the sum would be irrational. State whether Nathan is correct or incorrect. Justify your response.

The TAKEAWAY

When adding an irrational number and a rational number, the result is always _____.

When adding two irrational numbers, the result may be

_____ or _____.

Remember:

$R + R =$ _____

$I + R =$ _____

$I + I =$ _____

Review your notes before completing #'s 2 and 3. Make sure you come up with an "original expression". You may not use the expressions featured on today's notes.

1. Given: $A = \sqrt{6}$ $B = 5\sqrt{10}$ $C = \sqrt{25}$ $D = \sqrt[3]{64}$

Which expression does *not* result in an irrational number?

- (1) $A + B$ (2) $B + C$ (3) $C + D$ (4) $A + D$

2. Write a numerical expression of the sum of two irrational numbers resulting in an irrational number.

3. Write a numerical expression of the sum of two irrational numbers resulting in a rational number.

4. Liam says that the sum of $415.0\bar{2}$ and $\frac{3}{\sqrt{100}}$ is an irrational number. Do you agree or disagree? Explain your reasoning.