

Algebra RH

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

Do Now:

1) Add the following pairs of rational numbers.

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

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

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

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

Adding Rational Numbers

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

Adding Irrational Numbers



How do we add irrational numbers?

Note: 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

a) $\pi + \pi$

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

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

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

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

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.

Multiplying Radical Expressions

$$\text{Rule: } a\sqrt{b} \cdot c\sqrt{d} = ac\sqrt{bd}$$

1st: Multiply Coefficients

2nd: Multiply Radicands

Never multiply a coefficient and a radicand

Multiply the radical expressions below. Simplify if possible.

1) $\sqrt{2} \cdot \sqrt{5}$

2) $\sqrt{3} \cdot \sqrt{15}$

3) $6\sqrt{7} \cdot 4\sqrt{2}$

What type of number is the result of the product of two rational numbers?

a) 5×10

b) $\frac{1}{2} \times \frac{5}{9}$

c) -8.2×0

d) $\sqrt{4} \times \sqrt{25}$

Conclusion:

The **product** of two **rational** numbers is always a _____ number.

What type of number is the result of the product of a rational number and an irrational number?

a) $6 \times \sqrt{2}$

b) $\pi \times 100$

c) $\sqrt{4} \times \sqrt{5}$

d) $0 \times \sqrt{18}$

Conclusion:

The **product** of a **non-zero rational** number and an **irrational** number is always an _____ number.

What type of number is the result of the product of two irrational numbers?

a) $\pi \times \pi$

b) $\sqrt{2} \times \sqrt{5}$

c) $\sqrt{2} \times \sqrt{8}$

d) $(\sqrt{7})^2$

e) $\pi \times \frac{1}{\pi}$

Conclusion:

The **product** of two **irrational** numbers can result in a _____ number or an _____ number.