

Bellwork: Algebra

1. Write down your work for the week in your planner.
2. You need your Math Nation book, a calculator, and your Bingo board from Friday.
3. Answer the following question on your bellwork in the MONDAY box:

Simplify the following:

$$\left(8^{\frac{1}{2}}\right)\left(2^{\frac{5}{6}}\right)$$

$$\left(2^3\right)^{\frac{1}{2}} \cdot 2^{\frac{5}{6}}$$

$$2^{\frac{3}{2}} \cdot 2^{\frac{5}{6}}$$

$$2^{\frac{14}{6}} \text{ or } 2^{\frac{7}{3}}$$

$$\frac{2\frac{1}{2}}{\frac{6}{6}} + \frac{5}{6} = \frac{14}{6}$$

Let's review rational and irrational numbers.

- Numbers that can be represented as $\frac{a}{b}$, where a and b are integers and $b \neq 0$, are called rational numbers.
- Numbers that cannot be represented in this form are called irrational numbers.
 - Radicals that cannot be rewritten as integers are examples of such numbers.

Determine whether the following numbers are rational or irrational.

	Rational	Irrational
$\sqrt{9} = 3$	<input checked="" type="radio"/>	<input type="radio"/>
$\sqrt{8}$	<input type="radio"/>	<input checked="" type="radio"/>
π	<input type="radio"/>	<input checked="" type="radio"/>
$\frac{22}{7}$	<input checked="" type="radio"/>	<input type="radio"/>
$9.\overline{48}$	<input checked="" type="radio"/>	<input type="radio"/>
$\frac{33}{2}$	<input checked="" type="radio"/>	<input type="radio"/>
2.23606...	<input type="radio"/>	<input checked="" type="radio"/>
-25	<input checked="" type="radio"/>	<input type="radio"/>

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Given two rational numbers, a and b , prove that the sum of a and b is rational.

$$\frac{1}{2} + 102 = 102\frac{1}{2}$$

rational + rational = rational

Given two rational numbers, a and b , what can be said about the product of a and b ?

$$\frac{1}{2} \cdot 102 = 51$$

rational \cdot rational = rational

Given a rational number, a , and an irrational number, b , prove that the sum of a and b is irrational.

$$1,201 + \pi = 1,204.141592\dots$$

rational + irrational = irrational

Given a non-zero rational number, a , and an irrational number, b , what can be said about the product of a and b ?

$$1,201 \cdot \pi = \text{irrational}$$

rational \cdot irrational = irrational

Let's Practice!

1. Consider the following expression.

$$2 + \sqrt{3}$$

The above expression represents the

- sum
- product

of a(n)

- rational number
- irrational number

and a(n)

- rational number
- irrational number

and is equivalent to a(n)

- rational number.
- irrational number.

2. María and her 6 best friends are applying to colleges. They find that Bard College accepts $\frac{1}{3}$ of its applicants. María and her friends write the expression below to represent how many of them would likely be accepted.

$$7 \cdot \frac{1}{3}$$

The above expression represents the

- sum
 product

of a(n)

- rational number
 irrational number

and a(n)

- rational number
 irrational number

and is equivalent to a(n)

- rational number.
 irrational number.

1. Let a and b be non-zero rational numbers and c be an irrational number. Consider the operations below and determine whether the result will be rational or irrational.

$$a = 2$$

$$b = 1$$

$$c = \sqrt{3}$$

	Rational	Irrational
$a + b$	<input checked="" type="checkbox"/>	<input type="checkbox"/>
$a - c$	<input type="checkbox"/>	<input checked="" type="checkbox"/>
$a \cdot b$	<input checked="" type="checkbox"/>	<input type="checkbox"/>
$\frac{a}{b}$	<input checked="" type="checkbox"/>	<input type="checkbox"/>
$a \cdot b \cdot c$	<input type="checkbox"/>	<input checked="" type="checkbox"/>

2. Consider $x \cdot y = z$. If z is an irrational number, what can be said about x and y ?

$$\sqrt{5} \cdot \sqrt{5} = \sqrt{25} = 5$$

$$\sqrt{3} \cdot \sqrt{7} = \sqrt{21}$$