

For more such worksheets visit www.edugain.com

Answer the questions

- (1) Consider the following statement $\frac{a}{b} + \frac{c}{d} = \frac{c}{d} + \frac{a}{b}$. What property is being described

here?

- (2) Write the rational number that are equal to its negative.
- (3) Name the property that is reflected in the following expression:

A) $\frac{6}{9} \times \frac{9}{6} = 1$

B) $\frac{14}{24} \times 1 = 1 \times \frac{14}{24} = \frac{14}{24}$

- (4) Write the rational number that does not have a reciprocal.
- (5) What is the smallest rational number that can be formed using 2 of the numbers below in the form of $\frac{p}{q}$?

599, 749, 368, 964, 50, 445

- (6) How many total number of rational numbers are there between any two non equal rational numbers ?
- (7) Find the 5 rational numbers between $\frac{4}{13}$ and $\frac{-6}{8}$.

Choose correct answer(s) from given choice

- (8) Which of the following statement is true ?

a. $\frac{2}{-1} > \frac{2}{-2}$

b. $\frac{2}{-2} < \frac{-8}{8}$

c. $\frac{2}{-2} > \frac{-8}{8}$

d. $\frac{2}{-2} = \frac{-8}{8}$

(9) A rational number equivalent to $\frac{-4}{-5}$ is

a. $\frac{8}{-10}$

b. $\frac{8}{10}$

c. $\frac{-8}{10}$

d. None of these

(10) What is the relation of $\frac{2}{9}$ to $\frac{-2}{9}$ described as

a. Additive Inverse

b. Multiplicative Inverse

c. Multiplicative Identity

d. Additive Identity

(11) Consider the following statement $\frac{a}{b} + (\frac{c}{d} + \frac{e}{f}) = (\frac{a}{b} + \frac{c}{d}) + \frac{e}{f}$. What property is being described here?

a. Associative property

b. Inverse

c. Additive property

d. Commutative property

(12) If $\frac{3}{-8} = \frac{-9}{X}$, then $X =$ _____

a. 24

b. -24

c. 16

d. None of these

Fill in the blanks

(13) Find the multiplicative inverse of the following.

A)

$$\frac{-13}{16} \rightarrow \frac{\boxed{}}{\boxed{}}$$

B)

$$\frac{12}{18} \rightarrow \frac{\square}{\square}$$

(14) Fill in the blank to make the two rational numbers equivalent

A)

$$\frac{18}{\square} = \frac{162}{342}$$

B)

$$\frac{14}{\square} = \frac{56}{140}$$

C)

D)

(15) The rational number that are equal to their reciprocals are & .



© 2016 Edugain (www.edugain.com).
All Rights Reserved

Many more such worksheets can be
generated at www.edugain.com

Answers

(1) Commutative property

Step 1

If you look at the question carefully, you will notice that you have the following statement

$$\frac{a}{b} + \frac{c}{d} = \frac{c}{d} + \frac{a}{b} .$$

Step 2

According to the statement the sum of $\frac{a}{b}$ and $\frac{c}{d}$ is equal to the sum of $\frac{c}{d}$ and $\frac{a}{b}$.

Which is similar to the commutative property.

Commutative property states that order of addition does not matter.

for example : $3 + 2 = 2 + 3$

$$5 = 5$$

Step 3

Therefore the property of the statement is **commutative property** .

(2) 0

Step 1

Rational numbers: A rational number is any number that can be expressed as the quotient or fraction p/q of two integers, p and q , with the denominator q not equal to zero. Since q may be equal to 1, every integer is a rational number.

Rational number zero(0) is the only rational number that is equal to its negative.

Step 2

Therefore **zero(0)** is the only rational number that is equal to its negative.

(3) A) Multiplicative Inverse**Step 1**

We have asked to find the property that reflects in the following expression,

$$\frac{6}{9} \times \frac{9}{6} = 1.$$

Step 2

Compare the expression with the $a \times \frac{1}{a} = 1$

By comparing we find that a is $\frac{6}{9}$ and $\frac{1}{a}$ is $\frac{9}{6}$.

$$\frac{6}{9} \times \frac{9}{6} = 1$$

This property reflects the multiplicative inverse.

Step 3

Therefore, $\frac{6}{9} \times \frac{9}{6} = 1$ reflects the Multiplicative Inverse.

B) Multiplicative Identity**Step 1**

We have asked to find the property that reflects in the following expression,

$$\frac{14}{24} \times 1 = 1 \times \frac{14}{24} = \frac{14}{24}.$$

Step 2

Compare the expression with the $a \times 1 = 1 \times a = a$

By comparing we find that a is $\frac{14}{24}$.

This property reflects the multiplication identity.

Step 3

Therefore, $\frac{14}{24} \times 1 = 1 \times \frac{14}{24} = \frac{14}{24}$ reflects the Multiplicative Identity.

(4) 0

Step 1

Rational numbers: A rational number is any number that can be expressed as the quotient or fraction p/q of two integers, p and q , with the denominator q not equal to zero. Since q may be equal to 1, every integer is a rational number.

For example: reciprocal of $\frac{2}{3}$ is $\frac{3}{2}$.

Now,

$\frac{0}{a}$ is a rational number.

(where a is non-zero integer)

reciprocal of $\frac{0}{a}$ is $\frac{a}{0}$ which is not a rational number because denominator is not equal to zero(0) in rational numbers.

Step 2

Therefore rational number **zero(0)** does not have a reciprocal.

(5) $\frac{50}{964}$

Step 1

If you look at the question carefully, you will notice that you have to find out the value of smallest rational number that can be formed using 2 of the numbers below in the form of

$$\frac{p}{q}$$

599, 749, 368, 964, 50, 445.

Step 2**Rational number:**

A rational number is a number that can be written as a ratio. That means it can be written as a fraction, in which both the numerator (the number on top) and the denominator (the number on the bottom) are whole numbers.

For smallest rational number numerator (p) is the smallest number and denominator (q) is the largest number.

Now, p = 50 and q = 964

Hence, the smallest rational number is $\frac{50}{964}$.

Step 3

Therefore, the smallest rational number that can be formed using 2 of the numbers is $\frac{50}{964}$.

(6) Infinite

Step 1

Rational Number: A rational number is a number that can be expressed as a fraction. A rational number is said to have numerator and denominator.

Step 2

For example: $\frac{3}{2}$ or 1.5, $\frac{5}{2}$ or 2.5

rational numbers between these two rational numbers are 1.51, 1.52, 1.53, 1.54, 1.52, 1.6 and so on upto infinite.

Step 3

Therefore, **Infinite** rational numbers are there between any two non equal rational numbers.

(7) $\frac{-23}{104}$, $\frac{-23}{156}$, $\frac{-23}{208}$, $\frac{-23}{260}$, $\frac{-23}{312}$, (Answers can vary).

(8) d. $\frac{2}{-2} = \frac{-8}{8}$

Step 1

Let's look at all the options and see which one is correct.

Step 2

$\frac{2}{-1} > \frac{2}{-2}$, is the wrong statement, because for negative numbers, number with higher absolute value is smaller.

Step 3

$\frac{2}{-2} > \frac{-8}{8}$
 $\frac{-2}{2} = \frac{-2}{2}$, is the wrong statement. Because the numbers are equal.

Step 4

$\frac{2}{-2} < \frac{-8}{8}$
 $\frac{-2}{2} = \frac{-2}{2}$, is the wrong statement. Because the numbers are equal.

Step 5

$\frac{2}{-2} = \frac{-8}{8}$
 $\frac{-2}{2} = \frac{-2}{2}$, is the right statement. Because the numbers are equal.

Step 6

Therefore, the correct option is $\frac{2}{-2} = \frac{-8}{8}$.

(9) b. $\frac{8}{10}$

Step 1

If we multiply numerator and denominator of given fraction by 2,

$$\frac{-4}{-5} = \frac{-4 \times 2}{-5 \times 2}$$

$$\frac{-4}{-5} = \frac{-8}{-10}$$

$$\frac{-4}{-5} = \frac{8}{10}$$

Step 2

Therefore, $\frac{8}{10}$ is equivalent to $\frac{-4}{-5}$.

(10) a. Additive Inverse

Step 1

If you look at the question carefully, you will notice that you have to find out the additive inverse of $\frac{2}{9}$.

Step 2**Additive inverse:**

The Additive Inverse of a number is the opposite of the number. A number and its opposite add up to give zero. They are called additive inverses of each other.

So, by the help of definition the additive inverse of $\frac{2}{9}$ is $\frac{-2}{9}$.

Step 3

Therefore the additive inverse of $\frac{2}{9}$ is $\frac{-2}{9}$.

(11) a. Associative property**Step 1**

If you look at the question carefully, you will notice that the following statement is given

$$\frac{a}{b} + \left(\frac{c}{d} + \frac{e}{f} \right) = \left(\frac{a}{b} + \frac{c}{d} \right) + \frac{e}{f} .$$

Step 2

According to the statement sum of $\frac{a}{b} + \left(\frac{c}{d} + \frac{e}{f} \right)$ is equal to the sum of $\left(\frac{a}{b} + \frac{c}{d} \right) + \frac{e}{f}$.

Which is equal to the associative property.

Associative property states that if you are adding or multiplying it does not matter where you put the parenthesis. In other words, associative property states that you can add or multiply regardless of how the numbers are grouped. By 'grouped' we mean 'how you use parenthesis'.

For example : $2 + (3 + 5) = (2 + 3) + 5$

$$10 = 10$$

Step 3

Therefore the property of above statement is **associative property**.

(12) a. 24**Step 1**

According to the question, we have to find the value of X in the given equation:

$$\frac{3}{-8} = \frac{-9}{X}$$

Step 2

Now,

$$\frac{3}{-8} = \frac{-9}{X}$$

$$\Rightarrow 3 \times X = -8 \times -9$$

$$\Rightarrow 3X = 72$$

$$\Rightarrow X = \frac{72}{3}$$

$$\Rightarrow X = 24$$

Step 3

Therefore the value of X is **24**.

(13) A)

$$\frac{-13}{16} \rightarrow \frac{\boxed{16}}{\boxed{-13}}$$

Step 1

Multiplicative Inverse: When we multiply a number by its "Multiplicative Inverse", we get 1.

Mathematically,

$$n \times \frac{1}{n} = 1$$

Step 2

The multiplicative inverse of $\frac{-13}{16}$ is $\frac{16}{-13}$, since $\frac{-13}{16} \times \frac{16}{-13} = 1$.

B)

$$\frac{12}{18} \rightarrow \frac{\boxed{18}}{\boxed{12}}$$

Step 1

Multiplicative Inverse: When we multiply a number by its "Multiplicative Inverse", we get 1.

Mathematically,

$$n \times \frac{1}{n} = 1$$

Step 2

The multiplicative inverse of $\frac{12}{18}$ is $\frac{18}{12}$, since $\frac{12}{18} \times \frac{18}{12} = 1$.

(14) A)

38

To make the two rational numbers equivalent, first of all divide the given greatest numerator/denominator by the smallest numerator/denominator and divide the numerator/denominator which is in the front of blank by the result.

Now the number which make the rational numbers $\frac{18}{\boxed{}}$ and $\frac{162}{342}$ equivalent is

38.

B) 35

To make the two rational numbers equivalent, first of all divide the given greatest numerator/denominator by the smallest numerator/denominator and divide the numerator/denominator which is in the front of blank by the result.

Now the number which make the rational numbers $\frac{14}{\square}$ and $\frac{56}{140}$ equivalent is

35.

C) 57

To make the two rational numbers equivalent, first of all divide the given greatest numerator/denominator by the smallest numerator/denominator and multiply the numerator/denominator which is in the front of blank by the result.

Now the number which make the rational numbers $\frac{15}{19}$ and $\frac{45}{\square}$ equivalent is

57.

D) 207

To make the two rational numbers equivalent, first of all divide the given greatest numerator/denominator by the smallest numerator/denominator and multiply the numerator/denominator which is in the front of blank by the result.

Now the number which make the rational numbers $\frac{10}{23}$ and $\frac{90}{\square}$ equivalent is

207.

(15) 1 -1**Step 1**

Rational numbers: A rational number is any number that can be expressed as the quotient or fraction p/q of two integers, p and q , with the denominator q not equal to zero. Since q may be equal to 1, every integer is a rational number.

Rational numbers 1 and -1 are the only numbers which are equal to their reciprocals.

Step 2

Therefore rational numbers **1** and **-1** are equal to their reciprocals.