EXERCISE 4.5 PAGE NO: 4.20

1. Which of the following rational numbers are equal?
(i) (-9/12) and (8/-12)
(ii) (-16/20) and (20/-25)
(iii) (-7/21) and (3/-9)
(iv) (-8/-14) and (13/21)

Solution:
(i) Given (-9/12) and (8/-12)
The standard form of (-9/12) is (-3/4) [on diving the numerator and denominator of given number by their HCF i.e. by 3]
The standard form of (8/-12) = (-2/3) [on diving the numerator and denominator of given number by their HCF i.e. by 4]
Since, the standard forms of two rational numbers are not same. Hence, they are not equal.

(ii) Given (-16/20) and (20/-25)
Multiplying numerator and denominator of (-16/20) by the denominator of (20/-25) i.e. -25.
(-16/20) × (-25/-25) = (400/-500)
Now multiply the numerator and denominator of (20/-25) by the denominator of (-16/20) i.e. 20
(20/-25) × (20/20) = (400/-500)
Clearly, the numerators of the above obtained rational numbers are equal.
Hence, the given rational numbers are equal

(iii) Given (-7/21) and (3/-9)
Multiplying numerator and denominator of (-7/21) by the denominator of (3/-9) i.e. -9.
(-7/21) × (-9/-9) = (63/-189)
Now multiply the numerator and denominator of (3/-9) by the denominator of (-7/21) i.e. 21
(3/-9) × (21/21) = (63/-189)
Clearly, the numerators of the above obtained rational numbers are equal.
Hence, the given rational numbers are equal

(iv) Given (-8/-14) and (13/21)
Multiplying numerator and denominator of (-8/-14) by the denominator of (13/21) i.e. 21
(-8/-14) × (21/21) = (-168/-294)
Now multiply the numerator and denominator of (13/21) by the denominator of (-8/-14) i.e. -14
(13/21) × (-14/-14) = (-182/-294)
Clearly, the numerators of the above obtained rational numbers are not equal.
Hence, the given rational numbers are also not equal

2. In each of the following pairs represent a pair of equivalent rational numbers, find the values of x.
(i) (2/3) and (5/x)
(ii) (-3/7) and (x/4)
(iii) (3/5) and (x/-25)
(iv) (13/6) and (-65/x)

Solution:
(i) Given (2/3) and (5/x)
Also given that they are equivalent rational number so (2/3) = (5/x)
x = (5 × 3)/2
x = (15/2)

(ii) Given (-3/7) and (x/4)
Also given that they are equivalent rational number so (-3/7) = (x/4)
x = (-3 × 4)/7
x = (-12/7)

(iii) Given (3/5) and (x/-25)
Also given that they are equivalent rational number so (3/5) = (x/-25)
x = (3 × -25)/5
x = (-75)/5
x = -15

(iv) Given (13/6) and (-65/x)
Also given that they are equivalent rational number so (13/6) = (-65/x)
x = 6/13 x (- 65)

x = 6 x (-5)
x = -30

3. In each of the following, fill in the blanks so as to make the statement true:
(i) A number which can be expressed in the form p/q, where p and q are integers and q is not equal to zero, is called a ………..
(ii) If the integers p and q have no common divisor other than 1 and q is positive, then the rational number (p/q) is said to be in the ….
(iii) Two rational numbers are said to be equal, if they have the same …. form
(iv) If m is a common divisor of a and b, then (a/b) = (a ÷ m)/…..
(v) If p and q are positive Integers, then p/q is a ….. rational number and (p/-q) is a …… rational number.
(vi) The standard form of -1 is …
(vii) If (p/q) is a rational number, then q cannot be ….
(viii) Two rational numbers with different numerators are equal, if their numerators are in the same …. as their denominators.

Solution:
(i) Rational number
(ii) Standard form
(iii) Standard
(iv) b ÷ m
(v) Positive, negative
(vi) (-1/1)
(vii) Zero
(viii) Ratio

4. In each of the following state if the statement is true (T) or false (F):
(i) The quotient of two integers is always an integer.
(ii) Every integer is a rational number.
(iii) Every rational number is an integer.
(iv) Every traction is a rational number.
(v) Every rational number is a fraction.
(vi) If a/b is a rational number and m any integer, then (a/b) = (a x m)/ (b x m)
(vii) Two rational numbers with different numerators cannot be equal.
(viii) 8 can be written as a rational number with any integer as denominator.
(ix) 8 can be written as a rational number with any integer as numerator.

(x) (2/3) is equal to (4/6).

Solution:
(i) False

Explanation:
The quotient of two integers is not necessary to be an integer

(ii) True

Explanation:
Every integer can be expressed in the form of p/q, where q is not zero.

(iii) False

Explanation:
Every rational number is not necessary to be an integer

(iv) True

Explanation:
According to definition of rational number i.e. every integer can be expressed in the form of p/q, where q is not zero.

(v) False

Explanation:
It is not necessary that every rational number is a fraction.

(vi) True

Explanation:
If a/b is a rational number and m any integer, then (a/b) = (a x m)/ (b x m) is one of the rule of rational numbers

(vii) False

Explanation:
They can be equal, when simplified further.

(viii) False

Explanation:
8 can be written as a rational number but we can't write 8 with any integer as denominator.

(ix) False

Explanation:
8 can be written as a rational number but we can't with any integer as numerator.

(x) True

Explanation:
When convert it into standard form they are equal