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1. Find the sum:

(i) (5/4) + (-11/4)

Solution:-

We have:

= (5/4) – (11/4)

= [(5 - 11)/4] … [∵ denominator is same in both the rational numbers]

= (-6/4)

= -3/2 … [∵ Divide both numerator and denominator by 3]

(ii) (5/3) + (3/5)

Solution:-

Take the LCM of the denominators of the given rational numbers.

LCM of 3 and 5 is 15

Express each of the given rational numbers with the above LCM as the common denominator.

Now,

(5/3)= [(5×5)/ (3×5)] = (25/15)

(3/5)= [(3×3)/ (5×3)] = (9/15)

Then,

= (25/15) + (9/15) … [∵ denominator is same in both the rational numbers]

= (25 + 9)/15

= 34/15

(iii) (-9/10) + (22/15)

Solution:-

Take the LCM of the denominators of the given rational numbers.

LCM of 10 and 15 is 30

Express each of the given rational numbers with the above LCM as the common denominator.

Now,

(-9/10)= [(-9×3)/ (10×3)] = (-27/30)

(22/15)= [(22×2)/ (15×2)] = (44/30)

Then,

= (-27/30) + (44/30) … [∵ denominator is same in both the rational numbers]

= (-27 + 44)/30

= (17/30)

(iv) (-3/-11) + (5/9)

Solution:-

We have,

= 3/11 + 5/9

Take the LCM of the denominators of the given rational numbers.

LCM of 11 and 9 is 99

Express each of the given rational numbers with the above LCM as the common denominator.

Now,

(3/11)= [(3×9)/ (11×9)] = (27/99)

(5/9)= [(5×11)/ (9×11)] = (55/99)

Then,

= (27/99) + (55/99) … [∵ denominator is same in both the rational numbers]

= (27 + 55)/99

= (82/99)

(v) (-8/19) + (-2/57)

Solution:-

We have

= -8/19 – 2/57

Take the LCM of the denominators of the given rational numbers.

LCM of 19 and 57 is 57

Express each of the given rational numbers with the above LCM as the common denominator.

Now,

(-8/19)= [(-8×3)/ (19×3)] = (-24/57)

(-2/57)= [(-2×1)/ (57×1)] = (-2/57)

Then,

= (-24/57) - (2/57) … [∵ denominator is same in both the rational numbers]

= (-24 - 2)/57

= (-26/57)

(vi) -2/3 + 0

Solution:-

We know that any number or fraction is added to zero the answer will be the same

number or fraction.
Hence,
= -2/3 + 0
= -2/3

(vii) $-2\frac{1}{3} + 4\frac{3}{5}$
Solution:-
First we have to convert mixed fraction into improper fraction.
= $-2\frac{1}{3}$ = -7/3
= $4\frac{3}{5}$ = 23/5
We have, -7/3 + 23/5
Take the LCM of the denominators of the given rational numbers.
LCM of 3 and 5 is 15
Express each of the given rational numbers with the above LCM as the common denominator.
Now,
(-7/3)= [(-7×5)/ (3×5)] = (-35/15)
(23/5)= [(23×3)/ (15×3)] = (69/15)
Then,
= (-35/15) + (69/15) … [∵ denominator is same in both the rational numbers]
= (-35 + 69)/15
= (34/15)

2. Find
(i) 7/24 – 17/36
Solution:-
Take the LCM of the denominators of the given rational numbers.
LCM of 24 and 36 is 72
Express each of the given rational numbers with the above LCM as the common denominator.
Now,
(7/24)= [(7×3)/ (24×3)] = (21/72)
(17/36)= [(17×2)/ (36×2)] = (34/72)
Then,
= (21/72) - (34/72) … [∵ denominator is same in both the rational numbers]
= (21 - 34)/72

= (-13/72)

(ii) 5/63 – (-6/21)

Solution:-

We can also write -6/21 = -2/7

= 5/63 – (-2/7)

We have,

= 5/63 + 2/7

Take the LCM of the denominators of the given rational numbers.

LCM of 63 and 7 is 63

Express each of the given rational numbers with the above LCM as the common denominator.

Now,

(5/63)= [(5×1)/ (63×1)] = (5/63)

(2/7)= [(2×9)/ (7×9)] = (18/63)

Then,

= (5/63) + (18/63) … [∵ denominator is same in both the rational numbers]

= (5 + 18)/63

= 23/63

(iii) -6/13 – (-7/15)

Solution:-

We have,

= -6/13 + 7/15

LCM of 13 and 15 is 195

Express each of the given rational numbers with the above LCM as the common denominator.

Now,

(-6/13)= [(-6×15)/ (13×15)] = (-90/195)

(7/15)= [(7×13)/ (15×13)] = (91/195)

Then,

= (-90/195) + (91/195) … [∵ denominator is same in both the rational numbers]

= (-90 + 91)/195

= (1/195)

(iv) -3/8 – 7/11

Solution:-

Take the LCM of the denominators of the given rational numbers.
LCM of 8 and 11 is 88
Express each of the given rational numbers with the above LCM as the common denominator.
Now,

(-3/8)= [(-3×11)/ (8×11)] = (-33/88)

(7/11)= [(7×8)/ (11×8)] = (56/88)

Then,

= (-33/88) - (56/88) … [∵ denominator is same in both the rational numbers]

= (-33 - 56)/88

= (-89/88)

(v) $-2\frac{1}{9}$ - 6

Solution:-

First we have to convert the mixed fraction into improper fraction,

$-2\frac{1}{9}$ = -19/9

We have, -19/9 – 6
Take the LCM of the denominators of the given rational numbers.
LCM of 9 and 1 is 9
Express each of the given rational numbers with the above LCM as the common denominator.
Now,

(-19/9)= [(-19×1)/ (9×1)] = (-19/9)

(6/1)= [(6×9)/ (1×9)] = (54/9)

Then,

= (-19/9) - (54/9) … [∵ denominator is same in both the rational numbers]

= (-19 - 54)/9

= (-73/9)

3. Find the product:

(i) (9/2) × (-7/4)

Solution:-

The product of two rational numbers = (product of their numerator)/ (product of their denominator)
The above question can be written as (9/2) × (-7/4)

We have,

= (9×-7)/ (2×4)

= -63/8

(ii) (3/10) × (-9)

Solution:-

The product of two rational numbers = (product of their numerator)/ (product of their denominator)

The above question can be written as (3/10) × (-9/1)

We have,

= (3×-9)/ (10×1)

= -27/10

(iii) (-6/5) × (9/11)

Solution:-

The product of two rational numbers = (product of their numerator)/ (product of their denominator)

We have,

= (-6×9)/ (5×11)

= -54/55

(iv) (3/7) × (-2/5)

Solution:-

The product of two rational numbers = (product of their numerator)/ (product of their denominator)

We have,

= (3×-2)/ (7×5)

= -6/35

(v) (3/11) × (2/5)

Solution:-

The product of two rational numbers = (product of their numerator)/ (product of their denominator)

We have,

= (3×2)/ (11×5)

= 6/55

(vi) (3/-5) × (-5/3)

Solution:-

The product of two rational numbers = (product of their numerator)/ (product of their denominator)

We have,

= (3×-5)/ (-5×3)

On simplifying,

= (1×-1)/ (-1×1)

= -1/-1

= 1

4. Find the value of:

(i) (-4) ÷ (2/3)

Solution:-

We have,

= (-4/1) × (3/2) … [∵ reciprocal of (2/3) is (3/2)]

The product of two rational numbers = (product of their numerator)/ (product of their denominator)

= (-4×3) / (1×2)

= (-2×3) / (1×1)

= -6

(ii) (-3/5) ÷ 2

Solution:-

We have,

= (-3/5) × (1/2) … [∵ reciprocal of (2/1) is (1/2)]

The product of two rational numbers = (product of their numerator)/ (product of their denominator)

= (-3×1) / (5×2)

= -3/10

(iii) (-4/5) ÷ (-3)

Solution:-

We have,

= (-4/5) × (1/-3) … [∵ reciprocal of (-3) is (1/-3)]

The product of two rational numbers = (product of their numerator)/ (product of their denominator)

= (-4× (1)) / (5× (-3))
= -4/-15
= 4/15

(iv) (-1/8) ÷ 3/4
Solution:-
We have,
= (-1/8) × (4/3) … [∵ reciprocal of (3/4) is (4/3)]
The product of two rational numbers = (product of their numerator)/ (product of their denominator)
= (-1×4) / (8×3)
= (-1×1) / (2×3)
= -1/6

(v) (-2/13) ÷ 1/7
Solution:-
We have,
= (-2/13) × (7/1) … [∵ reciprocal of (1/7) is (7/1)]
The product of two rational numbers = (product of their numerator)/ (product of their denominator)
= (-2×7) / (13×1)
= -14/13

(vi) (-7/12) ÷ (-2/13)
Solution:-
We have,
= (-7/12) × (13/-2) … [∵ reciprocal of (-2/13) is (13/-2)]
The product of two rational numbers = (product of their numerator)/ (product of their denominator)
= (-7× 13) / (12× (-2))
= -91/-24
= 91/24

(vii) (3/13) ÷ (-4/65)
Solution:-
We have,
= (3/13) × (65/-4) … [∵ reciprocal of (-4/65) is (65/-4)]

The product of two rational numbers = (product of their numerator)/ (product of their denominator)

= (3×65) / (13× (-4))

= 195/-52

= -15/4