EXERCISE 5.4

1. Divide:
(i) 1 by (1/2)
(ii) 5 by (-5/7)
(iii) (-3/4) by (9/-16)
(iv) (-7/8) by (-21/16)
(v) (7/-4) by (63/64)
(vi) 0 by (-7/5)
(vii) (-3/4) by -6
(viii) (2/3) by (-7/12)

Solution:
(i) Given 1 by (1/2)
1 ÷ (1/2) = 1 × 2 = 2

(ii) Given 5 by (-5/7)
5 ÷ (-5/7) = 5 × (-7/5)
= -7

(iii) Given (-3/4) by (9/-16)
(-3/4) ÷ (9/-16) = (-3/4) × (-16/9)
= (-4/-3)
= (4/3)

(iv) Given (-7/8) by (-21/16)
(-7/8) ÷ (-21/16) = (-7/8) × (16/-21)
= (-2/-3)
= (2/3)

(v) Given (7/-4) by (63/64)
(7/-4) ÷ (63/64) = (7/-4) × (64/63)
= (-16/9)

(vi) Given 0 by (-7/5)
0 ÷ (-7/5) = 0 × (5/7)
= 0

(vii) Given (-3/4) by -6
(-3/4) ÷ -6 = (-3/4) × (1/-6)
= (-1/-8)
= (1/8)

(viii) Given (2/3) by (-7/12)
(2/3) ÷ (-7/12) = (2/3) × (12/-7)
= (8/-7)

2. Find the value and express as a rational number in standard form:
(i) (2/5) ÷ (26/15)
(ii) (10/3) ÷ (-35/12)
(iii) -6 ÷ (-8/17)
(iv) (40/98) ÷ (-20)

Solution:
(i) Given (2/5) ÷ (26/15)
(2/5) ÷ (26/15) = (2/5) × (15/26)
= (3/13)

(ii) Given (10/3) ÷ (-35/12)
(10/3) ÷ (-35/12) = (10/3) × (12/-35)
= (-40/35)
= (- 8/7)

(iii) Given -6 ÷ (-8/17)
-6 ÷ (-8/17) = -6 × (17/-8)
= (102/8)
= (51/4)

(iv) Given (40/98) ÷ -20
(40/98) ÷ -20 = (40/98) × (1/-20)
= (-2/98)
= (-1/49)

3. The product of two rational numbers is 15. If one of the numbers is -10, find the other.

Solution:
Let required number be x
x × - 10 = 15
x = (15/-10)
x = (3/-2)
x = (-3/2)
Hence the number is (-3/2)

4. The product of two rational numbers is (- 8/9). If one of the numbers is (- 4/15), find the other.

Solution:
Given product of two numbers = (-8/9)
One of them is (-4/15)
Let the required number be x
x × (-4/15) = (-8/9)
x = (-8/9) ÷ (-4/15)
x = (-8/9) × (15/-4)
x = (-120/-36)
x = (10/3)

5. By what number should we multiply (-1/6) so that the product may be (-23/9)?

Solution:
Given product = (-23/9)
One number is (-1/6)
Let the required number be x
x × (-1/6) = (-23/9)
x = (-23/9) ÷ (-1/6)
x = (-23/9) × (-6/1)
x = (-138/9)
x = (46/3)

6. By what number should we multiply (-15/28) so that the product may be (-5/7)?

Solution:
Given product = (-5/7)

One number is (-15/28)
Let the required number be x
x × (-15/28) = (-5/7)
x = (-5/7) ÷ (-15/28)
x = (-5/7) × (28/-15)
x = (-4/-3)
x = (4/3)

7. By what number should we multiply (-8/13) so that the product may be 24?

Solution:
Given product = 24
One of the number is = (-8/13)
Let the required number be x
x × (-8/13) = 24
x = 24 ÷ (-8/13)
x = 24 × (13/-8)
x = -39

8. By what number should (-3/4) be multiplied in order to produce (-2/3)?

Solution:
Given product = (-2/3)
One of the number is = (-3/4)
Let the required number be x
x × (-3/4) = (-2/3)
x = (-2/3) ÷ (-3/4)
x = (-2/3) × (4/-3)
x = (-8/-9)
x = (8/9)

9. Find (x + y) ÷ (x - y), if
(i) x = (2/3), y = (3/2)
(ii) x = (2/5), y = (1/2)
(iii) x = (5/4), y = (-1/3)

Solution:

(i) Given x = (2/3), y = (3/2)
(x + y) ÷ (x - y) = ((2/3) + (3/2)) ÷ ((2/3) – (3/2))
= (4 + 9)/6 ÷ (4 – 9)/6
= (4 + 9)/6 × (6/ (4 – 9)
= (4 + 9)/ (4 -9)
= (13/-5)

(ii) Given x = (2/5), y = (1/2)
(x + y) ÷ (x - y) = ((2/5) + (1/2)) ÷ ((2/5) – (1/2))
= (4 + 5)/10 ÷ (4 -5)/10
= (4 + 5)/10 × (10/ (4 – 5)
= (4 + 5)/ (4 -5)
= (9/-1)

(iii) Given x = (5/4), y = (-1/3)
(x + y) ÷ (x - y) = ((5/4) + (-1/3)) ÷ ((5/4) – (-1/3))
= (15 - 4)/12 ÷ (15 + 4)/12
= (15 - 4)/12 × (12/ (15 + 4)
= (15 - 4)/ (15 + 4)
= (11/19)

10. The cost of 7 (2/3) meters of rope is Rs. 12 (3/4). Find its cost per meter.

Solution:
Given cost of 7 (2/3) = (23/3) meters of rope is Rs. 12 (3/4) = (51/4)
Cost per meter = (51/4) ÷ (23/3)
= (51/4) × (3/23)
= (153/92)
= Rs 1 (61/92)

11. The cost of 2 (1/3) meters of cloth is Rs.75 (1/4). Find the cost of cloth per meter.

Solution:
Given cost of 2(1/3) metres of rope = Rs. 75 (1/4)
Cost of cloth per meter = 75 (1/4) ÷ 2 (1/3)
= (301/4) ÷ (7/3)
= (301/4) × (3/7)

= (129/4)
= Rs 32 (1/4)

12. By what number should (-33/16) be divided to get (-11/4)?

Solution:
Let the required number be x
(-33/16) ÷ x = (-11/4)
x = (-33/16) ÷ (-11/4)
x = (-33/16) × (4/-11)
x = (3/4)

13. Divide the sum of (-13/5) and (12/7) by the product of (-31/7) and (-1/2)

Solution:
Given
((-13/5) + (12/7)) ÷ (-31/7) x (-1/2)
= ((-13/5) × (7/7) + (12/7) × (5/5)) ÷ (31/14)
= ((-91/35) + (60/35)) ÷ (31/14)
= (-31/35) ÷ (31/14)
= (-31/35) × (14/31)
= (-14/35)
= (-2/5)

14. Divide the sum of (65/12) and (8/3) by their difference.

Solution:
((65/12) + (8/3)) ÷ ((65/12) – (8/3))
= ((65/12) + (32/12)) ÷ ((65/12) – (32/12))
= (65 + 32)/12 ÷ (65 -32)/12
= (65 + 32)/12 × (12/ (65 - 32)
= (65 + 32)/ (65 - 32)
= (97/33)

15. If 24 trousers of equal size can be prepared in 54 metres of cloth, what length of cloth is required for each trouser?

Solution:

Given material required for 24 trousers = 54m

Cloth required for 1 trouser = (54/24)

= (9/4) meters