

EXERCISE 5.4

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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 $(1/2)$

$$1 \div (1/2) = 1 \times 2 = 2$$

(ii) Given 5 by $(-5/7)$

$$5 \div (-5/7) = 5 \times (-7/5)$$

$$= -7$$

(iii) Given $(-3/4)$ by $(9/-16)$

$$(-3/4) \div (9/-16) = (-3/4) \times (-16/9)$$

$$= (-4/-3)$$

$$= (4/3)$$

(iv) Given $(-7/8)$ by $(-21/16)$

$$(-7/8) \div (-21/16) = (-7/8) \times (16/-21)$$

$$= (-2/-3)$$

$$= (2/3)$$

(v) Given $(7/-4)$ by $(63/64)$

$$(7/-4) \div (63/64) = (7/-4) \times (64/63)$$

$$= (-16/9)$$

(vi) Given 0 by $(-7/5)$

$$0 \div (-7/5) = 0 \times (5/7)$$

$$= 0$$

(vii) Given $(-3/4)$ by -6

$$\begin{aligned}(-3/4) \div -6 &= (-3/4) \times (1/-6) \\ &= (-1/-8) \\ &= (1/8)\end{aligned}$$

(viii) Given $(2/3)$ by $(-7/12)$

$$\begin{aligned}(2/3) \div (-7/12) &= (2/3) \times (12/-7) \\ &= (8/-7)\end{aligned}$$

2. Find the value and express as a rational number in standard form:

(i) $(2/5) \div (26/15)$

(ii) $(10/3) \div (-35/12)$

(iii) $-6 \div (-8/17)$

(iv) $(40/98) \div (-20)$

Solution:

(i) Given $(2/5) \div (26/15)$

$$\begin{aligned}(2/5) \div (26/15) &= (2/5) \times (15/26) \\ &= (3/13)\end{aligned}$$

(ii) Given $(10/3) \div (-35/12)$

$$\begin{aligned}(10/3) \div (-35/12) &= (10/3) \times (12/-35) \\ &= (-40/35) \\ &= (-8/7)\end{aligned}$$

(iii) Given $-6 \div (-8/17)$

$$\begin{aligned}-6 \div (-8/17) &= -6 \times (17/-8) \\ &= (102/8) \\ &= (51/4)\end{aligned}$$

(iv) Given $(40/98) \div -20$

$$\begin{aligned}(40/98) \div -20 &= (40/98) \times (1/-20) \\ &= (-2/98) \\ &= (-1/49)\end{aligned}$$

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

$$x \times -10 = 15$$

$$x = (15/-10)$$

$$x = (3/-2)$$

$$x = (-3/2)$$

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

$$x \times (-4/15) = (-8/9)$$

$$x = (-8/9) \div (-4/15)$$

$$x = (-8/9) \times (15/-4)$$

$$x = (-120/-36)$$

$$x = (10/3)$$



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

$$x \times (-1/6) = (-23/9)$$

$$x = (-23/9) \div (-1/6)$$

$$x = (-23/9) \times (-6/1)$$

$$x = (138/9)$$

$$x = (46/3)$$

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

$$x \times (-15/28) = (-5/7)$$

$$x = (-5/7) \div (-15/28)$$

$$x = (-5/7) \times (28/-15)$$

$$x = (-4/-3)$$

$$x = (4/3)$$

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

$$x \times (-8/13) = 24$$

$$x = 24 \div (-8/13)$$

$$x = 24 \times (13/-8)$$

$$x = -39$$

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

$$x \times (-3/4) = (-2/3)$$

$$x = (-2/3) \div (-3/4)$$

$$x = (-2/3) \times (4/-3)$$

$$x = (-8/-9)$$

$$x = (8/9)$$

9. Find $(x + y) \div (x - y)$, 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 $x = (2/3)$, $y = (3/2)$

$$\begin{aligned}(x + y) \div (x - y) &= ((2/3) + (3/2)) \div ((2/3) - (3/2)) \\ &= (4 + 9)/6 \div (4 - 9)/6 \\ &= (4 + 9)/6 \times (6/ (4 - 9)) \\ &= (4 + 9)/ (4 - 9) \\ &= (13/-5)\end{aligned}$$

(ii) Given $x = (2/5)$, $y = (1/2)$

$$\begin{aligned}(x + y) \div (x - y) &= ((2/5) + (1/2)) \div ((2/5) - (1/2)) \\ &= (4 + 5)/10 \div (4 - 5)/10 \\ &= (4 + 5)/10 \times (10/ (4 - 5)) \\ &= (4 + 5)/ (4 - 5) \\ &= (9/-1)\end{aligned}$$

(iii) Given $x = (5/4)$, $y = (-1/3)$

$$\begin{aligned}(x + y) \div (x - y) &= ((5/4) + (-1/3)) \div ((5/4) - (-1/3)) \\ &= (15 - 4)/12 \div (15 + 4)/12 \\ &= (15 - 4)/12 \times (12/ (15 + 4)) \\ &= (15 - 4)/ (15 + 4) \\ &= (11/19)\end{aligned}$$

10. The cost of $7 \frac{2}{3}$ meters of rope is Rs. $12 \frac{3}{4}$. Find its cost per meter.

Solution:

Given cost of $7 \frac{2}{3} = (23/3)$ meters of rope is Rs. $12 \frac{3}{4} = (51/4)$

$$\begin{aligned}\text{Cost per meter} &= (51/4) \div (23/3) \\ &= (51/4) \times (3/23) \\ &= (153/92) \\ &= \text{Rs } 1 \frac{61}{92}\end{aligned}$$

11. The cost of $2 \frac{1}{3}$ meters of cloth is Rs. $75 \frac{1}{4}$. Find the cost of cloth per meter.

Solution:

Given cost of $2 \frac{1}{3}$ metres of rope = Rs. $75 \frac{1}{4}$

$$\begin{aligned}\text{Cost of cloth per meter} &= 75 \frac{1}{4} \div 2 \frac{1}{3} \\ &= (301/4) \div (7/3) \\ &= (301/4) \times (3/7)\end{aligned}$$

$$= (129/4)$$
$$= \text{Rs } 32 \frac{1}{4}$$

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

Solution:

Let the required number be x

$$(-33/16) \div x = (-11/4)$$

$$x = (-33/16) \div (-11/4)$$

$$x = (-33/16) \times (4/-11)$$

$$x = (3/4)$$

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

Solution:

Given

$$((-13/5) + (12/7)) \div (-31/7) \times (-1/2)$$

$$= ((-13/5) \times (7/7) + (12/7) \times (5/5)) \div (31/14)$$

$$= ((-91/35) + (60/35)) \div (31/14)$$

$$= (-31/35) \div (31/14)$$

$$= (-31/35) \times (14/31)$$

$$= (-14/35)$$

$$= (-2/5)$$

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

Solution:

$$((65/12) + (8/3)) \div ((65/12) - (8/3))$$

$$= ((65/12) + (32/12)) \div ((65/12) - (32/12))$$

$$= (65 + 32)/12 \div (65 - 32)/12$$

$$= (65 + 32)/12 \times (12/ (65 - 32))$$

$$= (65 + 32)/ (65 - 32)$$

$$= (97/33)$$

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



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