

EXERCISE 5.3

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1. Multiply:

(i) $(7/11)$ by $(5/4)$

(ii) $(5/7)$ by $(-3/4)$

(iii) $(-2/9)$ by $(5/11)$

(iv) $(-3/13)$ by $(-5/-4)$

Solution:

(i) Given $(7/11)$ by $(5/4)$

$$(7/11) \times (5/4) = (35/44)$$

(ii) Given $(5/7)$ by $(-3/4)$

$$(5/7) \times (-3/4) = (-15/28)$$

(iii) Given $(-2/9)$ by $(5/11)$

$$(-2/9) \times (5/11) = (-10/99)$$

(iv) Given $(-3/13)$ by $(-5/-4)$

$$(-3/13) \times (-5/-4) = (-15/68)$$

2. Multiply:

(i) $(-5/17)$ by $(51/-60)$

(ii) $(-6/11)$ by $(-55/36)$

(iii) $(-8/25)$ by $(-5/16)$

(iv) $(6/7)$ by $(-49/36)$

Solution:

(i) Given $(-5/17)$ by $(51/-60)$

$$(-5/17) \times (51/-60) = (-225/-1020)$$

$$= (225/1020)$$

$$= (1/4)$$

(ii) Given $(-6/11)$ by $(-55/36)$

$$(-6/11) \times (-55/36) = (330/396)$$

$$= (5/6)$$

(iii) Given $(-8/25)$ by $(-5/16)$
 $(-8/25) \times (-5/16) = (40/400)$
 $= (1/10)$

(iv) Given $(6/7)$ by $(-49/36)$
 $(6/7) \times (-49/36) = (-294/252)$
 $= (-7/6)$

3. Simplify each of the following and express the result as a rational number in standard form:

(i) $(-16/21) \times (14/5)$

(ii) $(7/6) \times (-3/28)$

(iii) $(-19/36) \times 16$

(iv) $(-13/9) \times (27/-26)$

Solution:

(i) Given $(-16/21) \times (14/5)$
 $(-16/21) \times (14/5) = (224/105)$
 $= (-32/15)$

(ii) Given $(7/6) \times (-3/28)$
 $(7/6) \times (-3/28) = (-21/168)$
 $= (-1/8)$

(iii) Given $(-19/36) \times 16$
 $(-19/36) \times 16 = (-304/36)$
 $= (-76/9)$

(iv) Given $(-13/9) \times (27/-26)$
 $(-13/9) \times (27/-26) = (-351/234)$
 $= (3/2)$

4. Simplify:

(i) $(-5 \times (2/15)) - (-6 \times (2/9))$

(ii) $((-9/4) \times (5/3)) + ((13/2) \times (5/6))$

Solution:

$$\begin{aligned}
 & \text{(i) Given } (-5 \times (2/15)) - (-6 \times (2/9)) \\
 & (-5 \times (2/15)) - (-6 \times (2/9)) = (-10/15) - (-12/9) \\
 & = (-2/3) + (12/9) \\
 & = (-6/9) + (12/9) \\
 & = (6/9) \\
 & = (2/3)
 \end{aligned}$$

$$\begin{aligned}
 & \text{(ii) Given } ((-9/4) \times (5/3)) + ((13/2) \times (5/6)) \\
 & ((-9/4) \times (5/3)) + ((13/2) \times (5/6)) = ((-3/4) \times 5) + ((13/2) \times (5/6)) \\
 & = (-15/4) + (65/12) \\
 & = (-15/4) \times (3/3) + (65/12) \\
 & = (-45/12) + (65/12) \\
 & = (65 - 45)/12 \\
 & = (20/12) \\
 & = (5/3)
 \end{aligned}$$

5. Simplify:

$$\begin{aligned}
 & \text{(i) } ((13/9) \times (-15/2)) + ((7/3) \times (8/5)) + ((3/5) \times (1/2)) \\
 & \text{(ii) } ((3/11) \times (5/6)) - ((9/12) \times ((4/3)) + ((5/13) \times (6/15))
 \end{aligned}$$

Solution:

$$\begin{aligned}
 & \text{(i) Given } ((13/9) \times (-15/2)) + ((7/3) \times (8/5)) + ((3/5) \times (1/2)) \\
 & ((13/9) \times (-15/2)) + ((7/3) \times (8/5)) + ((3/5) \times (1/2)) = (-195/18) + (56/15) + (3/10) \\
 & = (-65/6) + (56/15) + (3/10) \\
 & = (-65/6) \times (5/5) + (56/15) \times (2/2) + (3/10) \times (3/3) \\
 & = (-325/30) + (112/30) + (9/30) \\
 & = (-325 + 112 + 9)/30 \\
 & = (-204/30) \\
 & = (-34/5)
 \end{aligned}$$

$$\begin{aligned}
 & \text{(ii) Given } ((3/11) \times (5/6)) - ((9/12) \times ((4/3)) + ((5/13) \times (6/15)) \\
 & ((3/11) \times (5/6)) - ((9/12) \times ((4/3)) + ((5/13) \times (6/15)) = (15/66) - (36/36) + (30/195) \\
 & = (5/22) - (12/12) + (1/11) \\
 & = (5/22) - 1 + (2/13) \\
 & = (5/22) \times (13/13) + (1/1) \times (286/286) + (2/13) \times (22/22) \\
 & = (65/286) - (286/286) + (44/286) \\
 & = (-177/286)
 \end{aligned}$$