

### 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:**

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

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