EXERCISE 4.2 PAGE NO: 4.8

1. Express each of the following as a rational number with positive denominator.
(i) (-15/-28)
(ii) (6/-9)
(iii) (-28/-11)
(iv) (19/-7)

Solution:
(i) Given (-15/-28)
Multiplying both numerator and denominator we can rational number with positive denominator.
(-15/-28) = (-15/-28) × (-1/-1)
= (15/28)

(ii) Given (6/-9)
Multiplying both numerator and denominator we can rational number with positive denominator.
(6/-9) = (6/-9) × (-1/-1)
= (-6/9)

(iii) Given (-28/-11)
Multiplying both numerator and denominator we can rational number with positive denominator.
(-28/-11) = (-28/-11) × (-1/-1)
= (28/11)

(iv) Given (19/-7)
Multiplying both numerator and denominator we can rational number with positive denominator.
(19/-7) = (19/-7) × (-1/-1)
= (-19/7)

2. Express (3/5) as a rational number with numerator:
(i) 6
(ii) -15

(iii) 21
(iv) -27

Solution:
(i) Given (3/5)
To get numerator 6 we have to multiply both numerator and denominator by 2
Then we get, (3/5) × (2/2) = (6/10)
Therefore (3/5) as a rational number with numerator 6 is (6/10)

(ii) Given (3/5)
To get numerator -15 we have to multiply both numerator and denominator by -5
Then we get, (3/5) × (-5/-5)
= (-15/-25)
Therefore (3/5) as a rational number with numerator -15 is (-15/-25)

(iii) Given (3/5)
To get numerator 21 we have to multiply both numerator and denominator by 7
Then we get, (3/5) × (7/7)
= (21/35)
Therefore (3/5) as a rational number with numerator 21 is (21/35)

(iv) Given (3/5)
To get numerator -27 we have to multiply both numerator and denominator by -9
Then we get, (3/5) × (-9/-9)
= (-27/-45)
Therefore (3/5) as a rational number with numerator -27 is (-27/-45)

3. Express (5/7) as a rational number with denominator:
(i) -14
(ii) 70
(iii) -28
(iv) -84

Solution:
(i) Given (5/7)
To get denominator -14 we have to multiply both numerator and denominator by -2
Then we get, (5/7) × (-2/-2)

= (-10/-14)
Therefore (5/7) as a rational number with denominator -14 is (-10/-14)

(ii) Given (5/7)
To get denominator 70 we have to multiply both numerator and denominator by -2
Then we get, (5/7) × (10/10)
= (50/70)
Therefore (5/7) as a rational number with denominator 70 is (50/70)

(iii) Given (5/7)
To get denominator -28 we have to multiply both numerator and denominator by -4
Then we get, (5/7) × (-4/-4)
= (-20/-28)
Therefore (5/7) as a rational number with denominator -28 is (-20/-28)

(iv) Given (5/7)
To get denominator -84 we have to multiply both numerator and denominator by -12
Then we get, (5/7) × (-12/-12)
= (-60/-84)
Therefore (5/7) as a rational number with denominator -84 is (-60/-84)

4. Express (3/4) as a rational number with denominator:
(i) 20
(ii) 36
(iii) 44
(iv) -80

Solution:
(i) Given (3/4)
To get denominator 20 we have to multiply both numerator and denominator by 5
Then we get, (3/4) × (5/5)
= (15/20)
Therefore (3/4) as a rational number with denominator 20 is (15/20)

(ii) Given (3/4)
To get denominator 36 we have to multiply both numerator and denominator by 9
Then we get, (3/4) × (9/9)

= (27/36)
Therefore (3/4) as a rational number with denominator 36 is (27/36)

(iii) Given (3/4)
To get denominator 44 we have to multiply both numerator and denominator by 11
Then we get, (3/4) × (11/11)
= (33/44)
Therefore (3/4) as a rational number with denominator 44 is (33/44)

(iv) Given (3/4)
To get denominator -80 we have to multiply both numerator and denominator by -20
Then we get, (3/4) × (-20/-20)
= (-60/-80)
Therefore (3/4) as a rational number with denominator -80 is (-60/-80)

5. Express (2/5) as a rational number with numerator:
(i) -56
(ii) 154
(iii) -750
(iv) 500

Solution:
(i) Given (2/5)
To get numerator -56 we have to multiply both numerator and denominator by -28
Then we get, (2/5) × (-28/-28)
= (-56/-140)
Therefore (2/5) as a rational number with numerator -56 is (-56/-140)

(ii) Given (2/5)
To get numerator 154 we have to multiply both numerator and denominator by 77
Then we get, (2/5) × (77/77)
= (154/385)
Therefore (2/5) as a rational number with numerator 154 is (154/385)

(iii) Given (2/5)
To get numerator -750 we have to multiply both numerator and denominator by -375
Then we get, (2/5) × (-375/-375)

= (-750/-1875)
Therefore (2/5) as a rational number with numerator -750 is (-750/-1875)

(iv) Given (2/5)
To get numerator 500 we have to multiply both numerator and denominator by 250
Then we get, (2/5) × (250/250)
= (500/1250)
Therefore (2/5) as a rational number with numerator 500 is (500/1250)

6. Express (-192/108) as a rational number with numerator:
(i) 64
(ii) -16
(iii) 32
(iv) -48

Solution:
(i) Given (-192/108)
To get numerator 64 we have to divide both numerator and denominator by -3
Then we get, (-192/108) ÷ (-3/-3)
= (64/-36)
Therefore (-192/108) as a rational number with numerator 64 is (64/-36)

(ii) Given (-192/108)
To get numerator -16 we have to divide both numerator and denominator by 12
Then we get, (-192/108) ÷ (12/12)
= (-16/9)
Therefore (-192/108) as a rational number with numerator -16 is (-16/9)

(iii)) Given (-192/108)
To get numerator 32 we have to divide both numerator and denominator by -6
Then we get, (-192/108) ÷ (-6/-6)
= (32/-18)
Therefore (-192/108) as a rational number with numerator 32 is (32/-18)

(iv) Given (-192/108)
To get numerator -48 we have to divide both numerator and denominator by 4
Then we get, (-192/108) ÷ (4/4)

= (-48/27)
Therefore (-192/108) as a rational number with numerator -48 is (-48/27)

7. Express (169/-294) as a rational number with denominator:
(i) 14
(ii) -7
(iii) -49
(iv) 1470

Solution:
(i) Given (169/-294)
To get denominator 14 we have to divide both numerator and denominator by -21
Then we get, (169/-294) ÷ (-21/-21)
= (-8/14)
Therefore (169/-294) as a rational number with denominator 14 is (-8/14)

(ii) Given (169/-294)
To get denominator -7 we have to divide both numerator and denominator by 42
Then we get, (169/-294) ÷ (42/42)
= (4/-7)
Therefore (169/-294) as a rational number with denominator -7 is (4/-7)

(iii) Given (169/-294)
To get denominator -49 we have to divide both numerator and denominator by 6
Then we get, (169/-294) ÷ (6/6)
= (28/-49)
Therefore (169/-294) as a rational number with denominator -49 is (28/-49)

(iv) Given (169/-294)
To get denominator 1470 we have to multiply both numerator and denominator by -5
Then we get, (169/-294) × (-5/-5)
= (-840/1470)
Therefore (169/-294) as a rational number with denominator 1470 is (-840/1470)

8. Write (-14/42) in a form so that the numerator is equal to:
(i) -2
(ii) 7

(iii) 42
(iv) -70

Solution:
(i) Given (-14/42)
To get numerator -2 we have to divide both numerator and denominator by 7
Then we get, (-14/42) ÷ (7/7)
= (-2/6)
Therefore (-14/42) as a rational number with numerator -2 is (-2/6)

(ii) Given (-14/42)
To get numerator 7 we have to divide both numerator and denominator by -2
Then we get, (-14/42) ÷ (-2/-2)
= (7/-21)
Therefore (-14/42) as a rational number with numerator -14 is (-14/21)

(iii) Given (-14/42)
To get numerator 42 we have to multiply both numerator and denominator by -3
Then we get, (-14/42) × (-3/-3)
= (42/-126)
Therefore (-14/42) as a rational number with numerator 42 is (42/-126)

(iv) Given (-14/42)
To get numerator -70 we have to multiply both numerator and denominator by 5
Then we get, (-14/42) × (5/5)
= (-70/210)
Therefore (-14/42) as a rational number with numerator -70 is (-70/210)

9. Select those rational numbers which can be written as a rational number with numerator 6:
(1/22), (2/3), (3/4), (4/-5), (5/6), (-6/7), (-7/8)

Solution:
Given rational numbers that can be written as a rational number with numerator 6 are:
Consider (1/22)
On multiplying by 6, (1/22) can be written as
(1/22) = (6/132)

Consider (2/3)
On multiplying by 3, (2/3) can be written as
(2/3) = (6/9)
Consider (3/4)
On multiplying by 2, (3/4) can be written as
(3/4) = (6/8)
Consider (-6/7)
On multiplying by -1, (-6/7) can be written as
(-6/7) = (6/-7)
Therefore rational numbers that can be written as a rational number with numerator 6 are (1/22), (2/3), (3/4) and (-6/7)

10. Select those rational numbers which can be written as rational number with denominator 4:
(7/8), (64/16), (36/-12), (-16/17), (5/-4), (140/28)

Solution:
Given rational numbers that can be written as a rational number with denominator 4 are:
(7/8) = (3.5/4) (On dividing both denominator and denominator by 2)
(64/16) = (16/4) (On dividing both denominator and numerator by 4)
(36/-12) = (-12/4) (On dividing both denominator and numerator by -3)
(5/- 4) = (- 5/4) (On multiplying both denominator and numerator by -1)
(140/28) = (20/4) (On dividing both numerator and denominator by 7)

11. In each of the following, find an equivalent form of the rational number having a common denominator:
(i) (3/4) and (5/12)
(ii) (2/3), (7/6) and (11/12)
(iii) (5/7), (3/8), (9/14) and (20/21)

Solution:
(i) Given (3/4) and (5/12)
On multiplying both numerator and denominator by 3
(3/4) = (3 × 3)/ (4 × 3) = (9/12)
Equivalent forms with same denominators are (9/12) and (5/12)

(ii) Given (2/3), (7/6) and (11/12)
On multiplying both numerator and denominator by 4
(2/3) = (2 × 4)/ (3 × 4) = (8/12)
And (7/6) = (7 × 2)/ (6 × 2) = (14/12)
Equivalent forms are (8/12), (14/12) and (11/12) having same denominators

(iii) Given (5/7), (3/8), (9/14) and (20/21)
(5/7) = (5 × 24)/ (7 × 24) = (120/168) [on multiplying both numerator and denominator by 24]
(3/8) = (3 × 21)/ (8 × 21) = (63/168) [on multiplying both numerator and denominator by 21]
(9/14) = (9 × 12)/ (14 × 12) = (108/168) [on multiplying both numerator and denominator by 12]
(20/21) = (20 × 8)/ (21×8) = (160/168) [on multiplying both numerator and denominator by 8]
Forms are (120/168), (63/168), (108/168) and (160/168) having same denominators.