

EXERCISE 4.2

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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.

$$\begin{aligned}(-15/-28) &= (-15/-28) \times (-1/-1) \\ &= (15/28)\end{aligned}$$

(ii) Given $(6/-9)$

Multiplying both numerator and denominator we can rational number with positive denominator.

$$\begin{aligned}(6/-9) &= (6/-9) \times (-1/-1) \\ &= (-6/9)\end{aligned}$$

(iii) Given $(-28/-11)$

Multiplying both numerator and denominator we can rational number with positive denominator.

$$\begin{aligned}(-28/-11) &= (-28/-11) \times (-1/-1) \\ &= (28/11)\end{aligned}$$

(iv) Given $(19/-7)$

Multiplying both numerator and denominator we can rational number with positive denominator.

$$\begin{aligned}(19/-7) &= (19/-7) \times (-1/-1) \\ &= (-19/7)\end{aligned}$$

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, $(3/5) \times (2/2) = (6/10)$

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, $(3/5) \times (-5/-5)$

$= (-15/-25)$

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, $(3/5) \times (7/7)$

$= (21/35)$

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, $(3/5) \times (-9/-9)$

$= (-27/-45)$

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, $(5/7) \times (-2/-2)$

$$= (-10/-14)$$

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, $(5/7) \times (10/10)$

$$= (50/70)$$

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, $(5/7) \times (-4/-4)$

$$= (-20/-28)$$

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, $(5/7) \times (-12/-12)$

$$= (-60/-84)$$

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, $(3/4) \times (5/5)$

$$= (15/20)$$

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, $(3/4) \times (9/9)$

$$= (27/36)$$

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, $(3/4) \times (11/11)$

$$= (33/44)$$

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, $(3/4) \times (-20/-20)$

$$= (-60/-80)$$

Therefore $(3/4)$ as a rational number with denominator -80 is $(-60/-80)$

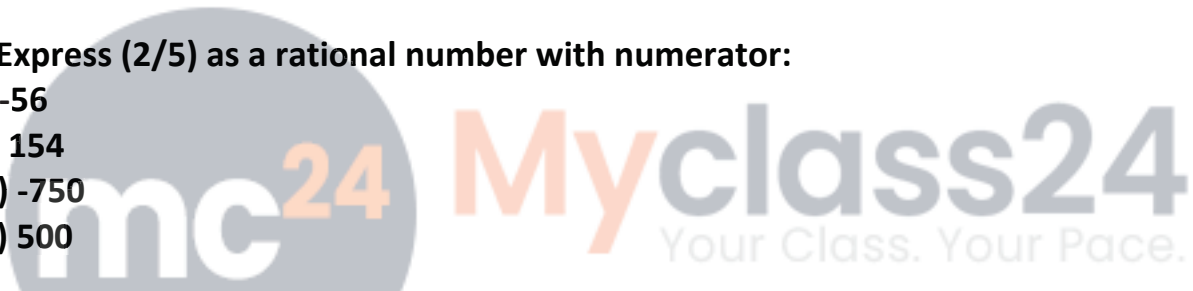
5. Express $(2/5)$ as a rational number with numerator:

(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, $(2/5) \times (-28/-28)$

$$= (-56/-140)$$

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, $(2/5) \times (77/77)$

$$= (154/385)$$

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, $(2/5) \times (-375/-375)$

$$= (-750/-1875)$$

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, $(2/5) \times (250/250)$

$$= (500/1250)$$

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, $(-192/108) \div (-3/-3)$

$$= (64/-36)$$

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, $(-192/108) \div (12/12)$

$$= (-16/9)$$

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, $(-192/108) \div (-6/-6)$

$$= (32/-18)$$

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, $(-192/108) \div (4/4)$

$$= (-48/27)$$

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, $(169/-294) \div (-21/-21)$

$$= (-8/14)$$

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, $(169/-294) \div (42/42)$

$$= (4/-7)$$

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, $(169/-294) \div (6/6)$

$$= (28/-49)$$

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, $(169/-294) \times (-5/-5)$

$$= (-840/1470)$$

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, $(-14/42) \div (7/7)$

$$= (-2/6)$$

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, $(-14/42) \div (-2/-2)$

$$= (7/-21)$$

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, $(-14/42) \times (-3/-3)$

$$= (42/-126)$$

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, $(-14/42) \times (5/5)$

$$= (-70/210)$$

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 $(\frac{2}{3})$

On multiplying by 3, $(\frac{2}{3})$ can be written as

$$(\frac{2}{3}) = (\frac{6}{9})$$

Consider $(\frac{3}{4})$

On multiplying by 2, $(\frac{3}{4})$ can be written as

$$(\frac{3}{4}) = (\frac{6}{8})$$

Consider $(-\frac{6}{7})$

On multiplying by -1, $(-\frac{6}{7})$ can be written as

$$(-\frac{6}{7}) = (\frac{6}{-7})$$

Therefore rational numbers that can be written as a rational number with numerator 6 are $(\frac{1}{22})$, $(\frac{2}{3})$, $(\frac{3}{4})$ and $(-\frac{6}{7})$

10. Select those rational numbers which can be written as rational number with denominator 4:

$(\frac{7}{8})$, $(\frac{64}{16})$, $(\frac{36}{-12})$, $(-\frac{16}{17})$, $(\frac{5}{-4})$, $(\frac{140}{28})$

Solution:

Given rational numbers that can be written as a rational number with denominator 4 are:

$$(\frac{7}{8}) = (\frac{3.5}{4}) \text{ (On dividing both denominator and numerator by 2)}$$

$$(\frac{64}{16}) = (\frac{16}{4}) \text{ (On dividing both denominator and numerator by 4)}$$

$$(\frac{36}{-12}) = (-\frac{12}{4}) \text{ (On dividing both denominator and numerator by -3)}$$

$$(\frac{5}{-4}) = (-\frac{5}{4}) \text{ (On multiplying both denominator and numerator by -1)}$$

$$(\frac{140}{28}) = (\frac{20}{4}) \text{ (On dividing both numerator and denominator by 7)}$$

11. In each of the following, find an equivalent form of the rational number having a common denominator:

(i) $(\frac{3}{4})$ and $(\frac{5}{12})$

(ii) $(\frac{2}{3})$, $(\frac{7}{6})$ and $(\frac{11}{12})$

(iii) $(\frac{5}{7})$, $(\frac{3}{8})$, $(\frac{9}{14})$ and $(\frac{20}{21})$

Solution:

(i) Given $(\frac{3}{4})$ and $(\frac{5}{12})$

On multiplying both numerator and denominator by 3

$$(\frac{3}{4}) = (\frac{3 \times 3}{4 \times 3}) = (\frac{9}{12})$$

Equivalent forms with same denominators are $(\frac{9}{12})$ and $(\frac{5}{12})$

(ii) Given $(\frac{2}{3})$, $(\frac{7}{6})$ and $(\frac{11}{12})$

On multiplying both numerator and denominator by 4

$$(\frac{2}{3}) = (2 \times 4) / (3 \times 4) = (\frac{8}{12})$$

$$\text{And } (\frac{7}{6}) = (7 \times 2) / (6 \times 2) = (\frac{14}{12})$$

Equivalent forms are $(\frac{8}{12})$, $(\frac{14}{12})$ and $(\frac{11}{12})$ having same denominators

(iii) Given $(\frac{5}{7})$, $(\frac{3}{8})$, $(\frac{9}{14})$ and $(\frac{20}{21})$

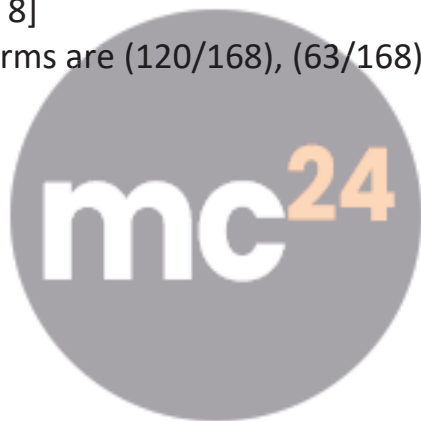
$(\frac{5}{7}) = (5 \times 24) / (7 \times 24) = (\frac{120}{168})$ [on multiplying both numerator and denominator by 24]

$(\frac{3}{8}) = (3 \times 21) / (8 \times 21) = (\frac{63}{168})$ [on multiplying both numerator and denominator by 21]

$(\frac{9}{14}) = (9 \times 12) / (14 \times 12) = (\frac{108}{168})$ [on multiplying both numerator and denominator by 12]

$(\frac{20}{21}) = (20 \times 8) / (21 \times 8) = (\frac{160}{168})$ [on multiplying both numerator and denominator by 8]

Forms are $(\frac{120}{168})$, $(\frac{63}{168})$, $(\frac{108}{168})$ and $(\frac{160}{168})$ having same denominators.



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