

**WELLAND GOULDSMITH SCHOOL**  
**MATHEMATICS**  
**CLASS 8**

**Answers**

**Exercise 1.1**

**1.**

(i)  $3/11+5/11=(3+5)/11=8/11$

(ii)  $-7/19+9/19=(-7+9)/19=2/19$

(iii)  $-11/5+-17/-15=-11/5+17/15=[(-11\times 3)+17]/15 =(-33+17)/15 = -16/15$

(iv)  $-13/8+12/-5=-13/8+(-12/5)= (-13\times 5+-12\times 8)/40 =[-65+(-96)]/40 =-161/40$

(v)  $-19/9+7/-9=-19/9+(-7/9) =[-19+(-7)]/9 =-26/9$

(vi)  $-7/8+-5/6=[(-7\times 3)+(-5\times 4)]/24 =(-21+-20)/24 =-41/24$

(vii)  $3^3/4+4^1/3=15/4+13/3 =[(15\times 3)+(13\times 4)]/12 =(45+52)/12 =97/12$

(viii)  $2^5/7+(-3/-14) =19/7+(-3/-14) =19/7+3/14 =[(19\times 2)+3]/14 =(38+3)/14 =41/14$

**2.**

(i)  $-11/12+(3/-8)+1/4 = -11/12+-3/8+1/4 = [(-11\times 2)+(-3\times 3)+(1\times 6)]/24 =(-22+-9+6)/24 =(-31+6)/24 =-25/24 =-1^1/24$

(ii)  $-7/10+13/15+27/20 = [(-7\times 6)+(13\times 4)+(27\times 3)]/60 =(-42+52+81)/60 =(-42+133)/60 =91/60 =1^31/60$

(iii)  $3^1/5+(-4^1/10)+1^1/2 =16/5+-41/10+3/2 = [(16\times 2)+(-41\times 1)+(3\times 5)]/10 =(32+-41+15)/10 = (32+15+-41)/10 = (47-41)/10 =6/10 =3/5$

(iv)  $-3/5+1/6+(-3/2) =-3/5+11/6+(-3/2) = [(-3\times 6)+(11\times 5)+(-3\times 15)]/30 =(-18+55+-45)/30 =(-63+55)/30 =-8/30 =-4/15$

**3.**

(i)  $3/4+-2/5 = [(3\times 5)+(-2\times 4)]/20 = (15+-8)/20 = 7/20$ -(i)

NOW

$-2/5+3/4 = [(-2\times 4)+(3\times 5)]/20 = (-8+15)/20 = 7/20$  (ii)

(i)=(ii). So Numbers are commutative under addition.

$$(ii) 7/-8 + -\frac{3}{4} = -\frac{7}{8} + -\frac{3}{4} = [(-7 \times 1) + (-3 \times 2)]/8 = (-7 + -6)/8 = -13/8 \quad (i)$$

Now

$$-\frac{3}{4} + 7/-8 = -\frac{3}{4} + -\frac{7}{8} = (-3 \times 2 + -7 \times 1)/8 = (-6 + -7)/8 = -13/8 \quad (ii)$$

(i)=(ii). So Numbers are commutative under addition.

**4.**

$$(i) -\frac{5}{8} + (9/8 + 13/8) = -\frac{5}{8} + (22/8) = (-5 + 22)/8 = 17/8 \quad (1)$$

Now

$$(-\frac{5}{8} + 9/8) + 13/8 = 4/8 + 13/8 = 17/8 \quad (2)$$

(1) = (2). So Numbers are ASSOCIATIVE under addition.

$$(ii) 3/10 + (-11/15 + -10/9) = 3/10 + [(-11 \times 3) + (-10 \times 5)]/45 = 3/10 + (-33 + -50)/45 = 3/10 + -83/45 \\ = [(3 \times 9) + (-83 \times 2)]/90 = (27 + -166)/90 = -139/90 \quad (i)$$

Now

$$(3/10 + -11/15) + -10/9 = [(3 \times 3 + -11 \times 2)]/30 + -10/9 = (9 + -22)/30 + -10/9 = -13/30 + -10/9 \\ = [(-13 \times 3) + (-10 \times 10)]/90 = (-39 + -100)/90 = -139/90 \quad (ii)$$

(i)=(ii). So Numbers are ASSOCIATIVE under addition.

**5.**

LHS

$$-8 + [-11/-12] = -8 + 11/12 = (-96 + 11)/12 = -85/12$$

RHS

$$-11/-12 + (-8) = 11/12 + (-8) = (11 + -96)/12 = -85/12$$

**LHS = RHS (Verified)**

**6.**

$$(i) -\frac{3}{8} \quad (ii) 0 \quad (iii) 17/9$$

**7.**

$$(i) 8/3 + (-11/5) + \frac{2}{3} = 8/3 + \frac{2}{3} + (-11/5) = 10/3 + (-11/5) = [(10 \times 5) + (-11 \times 3)]/15 = (50 + -33)/15 = 17/15$$

$$\frac{2}{3} + (-\frac{3}{4}) + \frac{5}{6} = \frac{2}{3} + \frac{5}{6} + -\frac{3}{4} = (4 + 5)/6 + -\frac{3}{4} = 9/6 + -\frac{3}{4} = (18 + -9)/12 = 9/12 = \frac{3}{4}$$

**8.**

$$a = 7/5$$

$$-(-a) = -(-7/5) = 7/5$$

$$\text{So } -(-a) = a$$

$$a = -11/18$$

$$-(-a) = -(-11/18) = 11/18$$

$$\text{So } -(-a) = a$$

9.

LHS

$$-(p+q) = -(\frac{7}{8} + -1/7) = -(7 \times 7 + -1 \times 8)/56 = -(49 + -8)/56 = -41/56$$

$$\text{RHS} = (-p) + (-q) = (-\frac{7}{8}) + (-1/7) = -\frac{7}{8} + 1/7 = (-49 + 8)/56 = -41/56$$

Here **LHS = RHS, SO VERIFIED**

10.

(i)Commutative law (ii)Additive Identity (iii)Associative law (iv)Additive Inverse (v)Associative law

### Exercise 1.2

1.

$$(i) -\frac{1}{4} - \frac{3}{8} = [(-1 \times 2) - (3 \times 1)]/8 = (-2 - 3)/8 = -\frac{5}{8}$$

$$(ii) -\frac{9}{10} - (-\frac{4}{5}) = -\frac{9}{10} + \frac{4}{5} = [(-9 \times 1) + (4 \times 2)]/10 = (-9 + 8)/10 = -\frac{1}{10}$$

$$(iii) -\frac{3}{7} - (-\frac{5}{8}) = -\frac{3}{7} + \frac{5}{8} = (-3 \times 8 + 5 \times 7)/56 = (-24 + 35)/56 = \frac{11}{56}$$

2.

$$(i) \frac{8}{63} - (-\frac{5}{21}) = [8 - (-5 \times 3)]/63 = [8 - (-15)]/63 = (8 + 15)/63 = \frac{23}{63}$$

$$(ii) -\frac{17}{5} - (-\frac{9}{10}) = -\frac{17}{5} + \frac{9}{10} = (-17 \times 2 + 9 \times 1)/10 = (-34 + 9)/10 = -\frac{25}{10} = -\frac{5}{2}$$

$$(iii) -\frac{2}{3} - \frac{5}{6} = (-2 \times 2 - 5 \times 1)/6 = (-4 - 5)/6 = -\frac{9}{6} = -\frac{3}{2}$$

5.

$$(i) -\frac{1}{5} - \frac{4}{7} - \frac{5}{21} = -\frac{1}{5} - (\frac{4}{7} + \frac{5}{21}) = -\frac{1}{5} - (\frac{4 \times 3 + 5 \times 1}{21}) = -\frac{1}{5} - \frac{17}{21} = \frac{-1 \times 21 - 17 \times 5}{105} = \frac{-21 - 85}{105} = -\frac{106}{105}$$

$$(ii) \frac{7}{8} - \frac{11}{12} + \frac{4}{15} = [(\frac{7 \times 15}{120}) - (\frac{11 \times 10}{120}) + (\frac{4 \times 8}{120})]/120 = (105 - 110 + 32)/120 = (137 - 110)/120 = \frac{27}{120} = \frac{9}{40}$$

$$(iii) -\frac{2}{3} + \frac{4}{9} - (-\frac{5}{6}) = [(-2 \times 6) + (4 \times 2) + (5 \times 3)]/18 = (-12 + 8 + 15)/18 = (-12 + 23)/18 = \frac{11}{18}$$

### Exercise 1.3

### EXERCISE 1.3

$$1. \text{ (i) } \frac{-50}{7} \times \frac{14^2}{3} = \frac{-100}{3} \quad \text{(ii) } \frac{20^{10}}{3} \times \frac{-13}{83} = \frac{-130}{9}$$

$$\text{(iii) } \frac{-7}{8} \times \frac{64^8}{9} = \frac{-56}{9} \quad \text{(iv) } \frac{-7}{8} \times \frac{16^2}{5} = \frac{-14}{5}$$

$$2. \text{ (i) } \left( \frac{3}{2} \times \frac{-7}{4} \right) - \left( \frac{-5}{2} \times \frac{3}{4} \right) \quad \text{(ii) } \left( \frac{-3}{7} \times \frac{7}{5} \right) + \left( \frac{17}{15} \times \frac{1}{5} \right)$$

$$= \frac{-21}{8} - \left( \frac{-15}{8} \right) \quad = \frac{-3}{5} + \frac{-1}{10}$$

$$= \frac{-21}{8} + \frac{15}{8} \quad = \frac{-6 + -1}{10}$$

$$= \frac{-21 + 15}{8} = \frac{-6}{8} = \frac{-3}{4} \quad = \frac{-7}{10}$$

3.

(i) 1/17 (ii) -1/13 (iii) 13/8 (iv) -16/7 (v) 20/27 (vi) does not exist

6.

LHS $(\frac{3}{5}) \times (-3/7) = -12/35$	RHS $(-3/7) \times 4/5 = -12/35$
(ii) LHS	RHS

$(-7/2) \times (4/5) = -28/10$	$4/5 \times (-7/2) = -28/10$
7. (i) LHS $7/9 \times (2/7 \times 4/-5)$ $= 7/9 \times 8/-35 = -8/45$	RHS $(7/9 \times 2/7) \times (4/-5)$ $= 2/9 \times 4/-5 = -8/45$
(ii) LHS $7/4 \times (-11/3 \times 1/2)$ $= 7/4 \times (-11/6)$ $= -77/24$	RHS $(7/4 \times -11/3) \times 1/2$ $= -77/12 \times 1/2 = -77/24$
8. (i) LHS $1/2 \times (4/3 + -3/5)$ $1/2 \times (20+ -9)/15$ $1/2 \times 11/15 = 11/30$	RHS $(1/2 \times 4/3) + (1/2 \times -3/5)$ $4/6 + -3/10$ $= (20+ -9)/30 = 11/30$
(ii) LHS $0 \times (-8/3 + 1) = 0 \times -5/3$ $= 0$	RHS $(0 \times -8/3) + (0 \times 1) = 0 + 0$ $= 0$
9. (i) LHS $x \times y = 1/2 \times 4/3 = 4/6$	RHS $y \times x = 4/3 \times 1/2 = 4/6$

In all these cases LHS = RHS. SO VERIFIED.

### **Exercise 1.4**

### EXERCISE 1.4

$$\begin{aligned}
 1. (i) \quad \frac{15}{7} \text{ by } \frac{-5}{7} \\
 \frac{15}{7} \div \frac{-5}{7} \\
 = \frac{15}{7} \times \frac{-7}{5} \\
 = \frac{-3}{1} = -3 \text{ Ans.}
 \end{aligned}$$

$$\begin{aligned}
 (ii) \quad -\frac{1}{8} \text{ by } \frac{3}{4} \\
 -\frac{1}{8} \div \frac{3}{4} \\
 = -\frac{1}{8} \times \frac{4}{3} \\
 = \frac{-1}{6} \text{ Ans} \\
 \underline{\underline{6}}
 \end{aligned}$$

$$\begin{aligned}
 (iii) \quad -4 \text{ by } \frac{-3}{5} \\
 -4 \div \frac{-3}{5} \\
 = -4 \times \frac{5}{3} \\
 = \frac{-20}{3} = -6\frac{2}{3} \\
 \underline{\underline{-6\frac{2}{3}}}
 \end{aligned}$$

$$\begin{aligned}
 2. (i) \quad \frac{-7}{12} \div \frac{21}{-3} \\
 = \frac{-7}{12} \times \frac{-3}{21} \\
 = \frac{1}{12} \text{ Ans.} \\
 \underline{\underline{\frac{1}{12}}}
 \end{aligned}$$

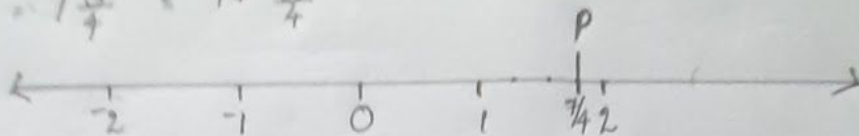
$$\begin{aligned}
 (ii) \quad 6 \div \frac{3}{4} \\
 = 6 \times \frac{4}{3} \\
 = \frac{8}{1} = \underline{\underline{8}}
 \end{aligned}$$

$$\begin{aligned}
 (iii) \quad -\frac{1}{15} \div \frac{8}{3} \\
 = -\frac{1}{15} \times \frac{3}{8} \\
 = \frac{-1}{40} \\
 \underline{\underline{\frac{-1}{40}}}
 \end{aligned}$$

### Exercise 1.5

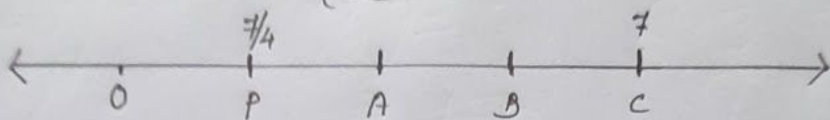
### EXERCISE 1.5

3.  $\frac{7}{4} = 1\frac{3}{4} = 1 + \frac{3}{4}$

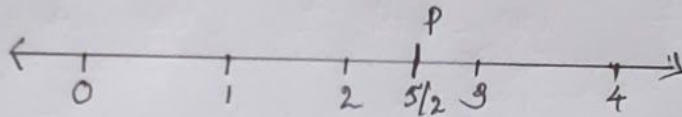


P is the point  $\frac{7}{4}$

(OR)

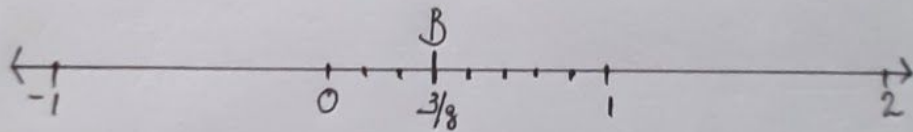


4.  $\frac{5}{2} = 2\frac{1}{2} = 2 + \frac{1}{2}$

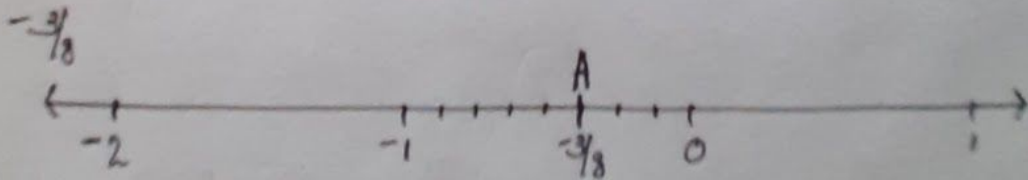


P is the point  $\frac{5}{2}$

5.  $\frac{3}{8}$



B is the point representing  $\frac{3}{8}$



A is the point representing  $-\frac{3}{8}$

### **EXERCISE 1.6**

1.  $1/2 \times (1/3 + 1/4) = 1/2 \times (4+3)/12 = 1/2 \times 7/12 = 7/24$

2.  $1/2 \times (1/5 + 1/3) = 1/2 \times (3+5)/15 = 1/2 \times 8/15 = 8/30$

3.  $1/2 \times (1/3 + 1/5) = 1/2 \times (5+3)/15 = 1/2 \times 8/15 = 4/15$

Now  $1/5 < 4/15 < 1/3$

Now let us find a Rational no. between  $1/5$  &  $4/15$

$\Rightarrow 1/2 \times (1/5 + 4/15) = 1/2 \times (3+4)/15 = 1/2 \times 7/15 = 7/30$

Now let us find a Rational no. between  $1/3$  &  $4/15$

$\Rightarrow 1/2 \times (1/3 + 4/15) = 1/2 \times (5+4)/15 = 1/2 \times 9/15 = 3/10$

$1/5 < 7/30 < 4/15 < 3/10 < 1/3$

**So,  $7/30$ ,  $4/15$ ,  $3/10$  are the required three Rational numbers.**

4.  $1/2 \times (-1/2 + -3/4) = 1/2 \times -5/4 = -5/8$

Now  $-3/4 < -5/8 < -1/2$

Now let us find a Rational no. between  $-3/4$  &  $-5/8$

$\Rightarrow 1/2 \times (-3/4 + -5/8) = 1/2 \times -11/8 = -11/16$

Now let us find a Rational no. between  $-5/8$  &  $-1/2$

$\Rightarrow 1/2 \times (-5/8 + -1/2) = 1/2 \times -9/8 = -9/16$

$-3/4 < -11/16 < -5/8 < -9/16 < -1/2$

**So,  $-11/16$ ,  $-5/8$ ,  $-9/16$  are the three Rational Numbers**

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