

ANSWERS

EXERCISE-1.1

1. 17 Nos 2. The greatest is 12 and the smallest is -12,
4. Any 5 integers beginning with -14 to the left.
5. (i) true (ii) false (iii) true (iv) false (v) true
9. (i) (-15) (ii) 5 (iii) 0 (iv) -8 (v) -12
10. 20 km 11. ₹ 75 12. 35°C 13. ₹ 660
14. 23 15. 23 16. -28
18. (i) true (ii) true (iii) false (iv) false (v) true

EXERCISE-1.2

1. (i) -10 (ii) -21 (iii) 12 (iv) 129 (v) 0
(vi) 2420 (vii) 195 (viii) -1674 (ix) -30
2. (i) true (ii) false (iii) true
3. (i) -3 (ii) -51 (iii) -a
4. (i) -54000 (ii) 9700 (iii) 891 (iv) 580 (v) -15000 (vi) 61,731
5. (i) 54,000 (ii) 60,000 (iii) 45,225
6. (i) 10,320 (ii) 15,900 (iii) 670 (iv) 99,000 (v) 2,820
7. (i) wrong (ii) right (iii) right (iv) wrong (v) wrong

EXERCISE-1.3

1. (i) -3 (ii) -6 (iii) 9 (iv) 0 (v) 1 (vi) -4
2. (i) -24 (ii) -6 (iii) 20 (iv) 123
3. (i) -56 (ii) -25 5. (i) 30 marks (ii) -5 marks .
6. (i) Suman 8 Nos (ii) Jaya 18 Nos 7. (i) profit of ₹ 18,500 (ii) 400 Bags

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EXERCISE -2.1

1. A. (i) 4 (ii) $1\frac{2}{5}$ (iii) $13\frac{3}{4}$ (iv) 104 (v) $19\frac{1}{4}$
 B. (i) $\frac{1}{63}$ (ii) $\frac{1}{195}$ (iii) $\frac{6}{25}$ (iv) $2\frac{2}{5}$ (v) $1\frac{13}{33}$
 C. (i) 50 (ii) $46\frac{2}{5}$ (iii) $37\frac{1}{2}$ (iv) 12 (v) 25
2. (i) $\frac{1}{35}$ (ii) $\frac{8}{15}$ (iii) $1\frac{1}{2}$ (iv) $\frac{3}{8}$ (v) $3\frac{1}{2}$
3. $\frac{2}{5}$ 4. No (ii) is smaller 5. $\frac{3}{5} > \frac{2}{7} > \frac{4}{35}$
6. $\frac{1}{6} < \frac{2}{5} < \frac{13}{30}$ 7. Rujun reads more 8. 30 pages 9. ₹ 160
10. 150 liter 11. $\frac{3}{20}$ parts 12. 216 Nos
13. (i) $\frac{3}{5}$ (ii) 7 and 2 (iii) $\frac{3}{2}$ (iv) 7 and 5

EXERCISE-2.2

1. (a) $\frac{1}{6}$ (b) $\frac{2}{1}$ (c) $\frac{17}{8}$ (d) 1 (e) $\frac{5}{13}$
2. A. (i) 16 (ii) $46\frac{1}{2}$ (iii) $\frac{4}{3}$ (iv) $\frac{16}{3}$ (v) $\frac{12}{1}$
 B. (i) $\frac{3}{4}$ (ii) $\frac{4}{7}$ (iii) $\frac{4}{3}$ (iv) $\frac{13}{9}$ (v) $\frac{31}{49}$
 C. (i) $2\frac{5}{7}$ (ii) $\frac{1}{3}$ (iii) $2\frac{8}{11}$ (iv) $1\frac{31}{84}$
3. (i) $\frac{8}{55}$ (ii) $\frac{105}{121}$ (iii) $\frac{7}{9}$ (iv) $\frac{7}{3}$ (v) 72 km
4. $3\frac{3}{5}$ cm 5. $1\frac{1}{4}$ m 6. 6 Nos 7. 3 Nos
8. 5000 km 9. $4\frac{1}{10}$ m 10. (iii)

EXERCISE-2.3

1. (i) $3 \times 1 + 0 \times \frac{1}{10} + 5 \times \frac{1}{100}$ (ii) $3 \times 10 + 0 \times 1 + 5 \times \frac{1}{10}$
 (iii) $2 \times 100 + 3 \times 10 + 5 \times 1 + 0 \times \frac{1}{10} + 0 \times \frac{1}{100} + 5 \times \frac{1}{100}$
 (iv) $2 \times 10000 + 3 \times 1000 + 0 \times 100 + 0 \times 10 + 5 \times 1 + 0 \times \frac{1}{10} + 0 \times \frac{1}{100} + 5 \times \frac{1}{1000}$
2. (i) 0.2 m and 0.0002 km (ii) 2.67 m and 0.000267 km
 (iii) 25.732 m and 0.025732 km (iv) 35.4 m and 0.00354 km
3. (i) 0.52 kg (ii) 4.273 kg (iii) 6.9205 kg (iv) 2.005 kg
4. (i) ₹ 0.05 (ii) ₹ 5.05 (iii) 55.55 kg (iv) ₹ 50.50
5. (i) 0.2 (ii) 3.3 (iii) 5 (iv) 0.44
6. Pranjal ; 0.03 m

EXERCISE-2.4

1. (i) 0.05 (ii) 16.2 (iii) 15.56 (iv) 64.89 (v) 93.6
2. (i) 6 (ii) 28 (iii) 570 (iv) 379 (v) 428.6
 (vi) 1254 (vii) 2234 (viii) 3952.4 (ix) 0.8 (x) 10.5
3. (i) 0.255 (ii) 0.0625 (iii) 5.5735 (iv) 18.525 (v) 220.066
 (vi) 102.0201 (vii) 0.025 (viii) 7.7765
4. 49.75 m 5. 5.76 cm² 6. 1550 km

EXERCISE-2.5

1. (i) 0.3 (ii) 0.08 (iii) 0.55 (iv) 15.36 (v) 6.03
 (vi) 0.99 (vii) 2.09 (viii) 28.7
2. (i) 0.09 (ii) 2.14 (iii) 0.052 (iv) 52.11 (v) 23.675
 (vi) 5.2733 (vii) 1.237 (viii) 0.0001 (ix) 0.01482

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- (x) 0.0007 (xi) 0.0021 (xii) 0.22421 (xiii) 0.00006
(xiv) 1.11305 (xv) 8.41127 (xvi) 0.0845
3. (i) 2 (ii) 43.2 (iii) 82.35 (iv) 8235 (v) 510
(vi) 15.175 (vii) 2804.2 (viii) 0.5
4. ₹ 99.50. 5. 43km 6. ₹ 18.65. 7. 19.2m 8. 13.5m

EXERCISE-3.1

1. Average = 5.5, range = 9 2. (i) 18 (ii) 6 (iii) 12 (iv) 11
3. 74 4. 54 Persons 5. 51
6. (i) 31 kg (ii) 4 Persons (iii) No
7. Average saving ₹ 580/pm 8. (i) 30 Persons (ii) 31 Persons

EXERCISE-3.2

1. (i) 5 (ii) 41 2. 13 3. (i) 5 (ii) 9
4. Mode = 35, Median = 28, Not the same
5. Mode = 14, Median = 14, Yes, same
6. Mean value = 14.30, Mode = 14, Median = 14
7. Range = 45, Mean value = 21.82, Mode = 15, Median = 20
8. (i) true (ii) false (iii) true
9. (i) Mean value = 13.55, Mode = 18, Median = 18
(ii) Mean value = 15.45, Mode = 10, 16 and 18, Median = 16
(iii) Mean value = 19.22, Mode = No, Median = 15

EXERCISE-3.3

1. (a) (i) 60 Persons (ii) 195 Persons (iii) 20 Persons
(b) (i) 8 Persons (ii) 65 (iii) 11 Persons
2. (i) 2015 (ii) 1800 Persons

4. (i) Assamese (ii) Social Science (iii) Mathematics, Seven
 5. (i) 2017 (ii) 150 Nos (iii) 1000 Nos

EXERCISE-3.4

1. (i) will happen surely (ii) may happen but not sure (iii) impossible
 (iv) may happen but not sure (v) impossible
 2. (i) $\frac{1}{4}$ (ii) $\frac{1}{4}$ 3. $\frac{1}{5}$ 4. $\frac{5}{9}$ 5. $\frac{5}{12}$

EXERCISE-4.1

1. (i) $6x+5=35$ (ii) $=9$ (iii) $5x-20=5$ (iv) $7x+3=10$
 (v) $\frac{x}{5}-4=2$ (vi) $4p=20$ (vii) $3x-1=2$ (viii) $\frac{x}{10}-10=40$
 2. (i) Subtraction of 4 from 3times of number results 5.
 (ii) Dividing m by 3, add 6 to get 11
 (iii) 7 times of a number is equal to 42.
 (iv) Dividing a number 6 will be got 2
 (v) Adding 7 with 5 times of a number will be got 2.
 (vi) Substraction of 1 from half of a number results 4.
 3. (i) $3x+1=22$ (Assuming age of Nirupoma as 'x')
 (ii) $7x+2=72$ (Assuming age of Anjan as 'x')
 (iii) $4a=32$ (a- length of side of square)
 (iv) $20x+10(x-1)=50$ (Assuming quantity of potato s 'x' kg)
 (v) $x+2x+3x=180^\circ$ (Assuming the smallest angle as 'x')
 4. (i) Yes (ii) No (iii) Yes (iv) No. (v) Yes
 (vi) Yes (vii) No (viii) Yes (ix) Yes (x) No

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EXERCISE--4.2

1.

	Equation	First Step	Solution
i	$x+5 = 12$	$x + 5 - 5 = 12 - 5$	7
ii	$x - 7 = 0$	$(x - 7) + 7 = 0 + 7$	7
iii	$y - 3 = 6$	$y - 3 + 3 = 6 + 3$	9
iv	$z+6 = 5$	$z + 6 - 6 = 5 - 6$	-1
v)	$3x = 42$	$\frac{3x}{3} = \frac{42}{3}$	14
vi	$\frac{x}{5} = 6$	$5 \times \frac{x}{5} = 5 \times 6$	30
vii	$12x = -36$	$\frac{12x}{12} = \frac{-36}{12}$	-3
viii	$\frac{x}{4} = \frac{3}{2}$	$\frac{x}{4} \times 4 = \frac{3}{2} \times 4$	6
ix	$7x = 35$	$\frac{7x}{7} = \frac{35}{7}$	5
x	$\frac{p}{4} = 3$	$\frac{p}{4} \times 4 = 3 \times 4$	12

2.

	Equation	First step	2nd Step	3rd step	Solution
i	$4x+5 = 45$	$4x+5-5 = 45-5$	$\frac{4x}{4} = \frac{40}{4}$	—	$x = 10$
ii	$3x - 7 = 11$	$3x-7+7=11+7$	$\frac{3x}{3} = \frac{18}{3}$	—	$x = 6$
iii	$\frac{2x}{3} + 5 = 7$	$\frac{2x}{3} + 5 - 5 = 7 - 5$	$\frac{2x}{3} \times 3 = 2 \times 3$	$\frac{2x}{2} = \frac{6}{2}$	$x = 3$
iv	$\frac{4y}{5} - 7 = 5$	$\frac{4y}{5} - 7 + 7 = 5 + 7$	$\frac{4y}{5} \times 5 = 12 \times 5$	$\frac{4y}{4} = \frac{60}{4}$	$x=15$

3. (i) $x=6$ (ii) $x=2$ (iii) $y=24$ (iv) $y=20$ (v) $p=5$
 (vi) $p=2$ (vii) $x=3$ (viii) $x=5$ (ix) $q=9$ (x) $x=13$
 (xi) $x=4$ (xii) $x=6$ (xiii) $p=21$ (xiv) $q=6$ (xv) $x=1$

EXERCISE-4.3

1. (i) 3 (ii) 21 (iii) 2 (iv) 6 (v) $\frac{33}{2}$ (vi) 4
(vii) 4 (viii) 16
2. Marble with Amal = 13, Marble with Ramen = 26 3. $\frac{3}{7}$ 4. 36 cm^2
5. Age of Rehana = 8 years, Age of Aripul = 12 years
6. Age of Rahul = 7 years, Age of Anupoma = 6 years, Age of Jahirul = 9 years,
7. 10 years,
8. Naren 50, Shreya - 100, Anubhav - 95, Irfan - 55, Paruma - 70, and Rabin - 65
9. 23, 25, 27 10. 18, 20
11. 62 12. 15, 16, 17, 13. 15, 25 14. 96, 36
15. Length = 24 meter, breadth = 12 meter,
16. Age of Ajoy = 1 years, Age of Bijoy = 6 years
17. Age of Ramen = 10 years, Age of Ramen's father = 40 years
18. Price of a chair = ₹ 125, Price of a table = ₹ 165 .
19. $39^\circ, 51^\circ$

EXERCISE-5.1

1. (a) 45° (b) 25° (c) 49° (d) 36°
2. $56^\circ, 34^\circ$
3. (a) 80° (b) 90° (c) 125° (d) 55°
4. $68^\circ, 112^\circ$ 5. $\angle POQ = 130^\circ, \angle QOS = 50^\circ, \angle SOP = 130^\circ,$
6. 75° 7. 90° 8. 57°
9. 29° 10. 75° 11. 150° 12. $108^\circ, 72^\circ$
13. $40^\circ, 50^\circ$ 14. (a) $x = 40^\circ, y = 140^\circ$ (b) $x = 35^\circ$
15. (a), (b) 16. (a), (c)

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EXERCISE-5.2

1. (a) $x = 70^\circ$, $y = 30^\circ$, $z = 80^\circ$ (b) $x = 35^\circ$
(c) $x = 80^\circ$, $y = 60^\circ$, $z = 40^\circ$ (d) $x = 80^\circ$
2. (a) 3. $x = 285^\circ$
4. (a) $x = 120^\circ$ (b) $x = 120^\circ$ (c) $x = 60^\circ$

EXERCISE-5.3

- | | | | |
|-------|-------|-------|-------|
| 1. c | 2. b | 3. c | 4. b |
| 5. b | 6. c | 7. c | 8. d |
| 9. d | 10. b | 11. b | 12. b |
| 13. b | 14. d | | |

EXERCISE-6.1

- | | |
|---------------|-----------------------------------|
| 1. 3 | 7. S |
| 2. 3 | 8. (i) b. Altitude (ii) c. median |
| 5. $\angle N$ | |
| 6. PR | |

EXERCISE-6.2

- | | |
|-----------------------|--------------------|
| 1. (a) Interior angle | (b) Exterior angle |
| 2. (a) 12° | (b) 50° |
| (d) 50° | (c) 35° |
| (e) 40° | (f) 30° |
| 3. 45° | 4. 140° |
| 5. 89° | 6. 90° |

EXERCISE-6.3

- | | | | | |
|--|-------------------|----------------|-------------------------------------|----------------|
| 1. (a) 70° | (b) 60° | (c) 90° | (d) 40° | (e) 45° |
| 2. (a) $x = 50^\circ$, $y = 80^\circ$ | b) $x = 60^\circ$ | $y = 90^\circ$ | (c) $x = 60^\circ$, $y = 60^\circ$ | |

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3. d
 4. 81° 5. 70°
 6. $50^\circ, 50^\circ$
 7. $45^\circ, 90^\circ, 45^\circ$
 8. $x = 56^\circ$
 9. $30^\circ, 60^\circ, 90^\circ$
 10. $54^\circ, 62^\circ, 64^\circ$
 11. $90^\circ, 60^\circ, 30^\circ$
 12. (a) 70° , (b) 35°

EXERCISE-6.4

1. 21cm 2. 3cm 3. 20cm
 5. (d) 6. (a)

EXERCISE-6.5

1. b 2. d 3. b 4. a
 5. a 6. b 7. a 8. b
 9. c 10. c 11. b 12. b

EXERCISE-7.1

1. (a) RHS (b) SSS (c) RHS (d) RHS
 (e) SSS (f) SAS (g) AAS (h) AAS or ASA

EXERCISE-7.2

1. b 2. c 3. a 4. c 5. c
 6. a 7. a 8. b

EXERCISE-8.1

1. (i) 10:1 (ii) 2:1 (iii) 24:7 (iv) 12:1 (v) 14:3
 2. (i) No (ii) Yes (iii) Yes (iv) No
 3. 26 Nos of Geometry boxes 4. Purchased in same price 5. ₹ 16,500

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EXERCISE-8.2

1. (i) 60% (ii) $58\frac{1}{3}\%$ (iii) $46\frac{7}{8}\%$ (iv) 42% (v) $51\frac{1}{2}\%$
2. (i) 80% (ii) 575% (iii) 8% (iv) 3210% (v) 0.4%
3. (i) $\frac{1}{5}$ (ii) $\frac{8}{25}$ (iii) $\frac{1}{200}$ (iv) $\frac{29}{40}$ (v) $1\frac{4}{5}$
4. (i) 0.18, $\frac{9}{50}$ (ii) 0.25, $\frac{1}{4}$ (iii) 0.60, $\frac{3}{5}$
(iv) 0.425, $\frac{17}{40}$ (v) 0.56, $\frac{14}{25}$
5. (i) 40% (ii) 55% (iii) 38% (iv) 12% (v) 225%
6. (i) 18:25 (ii) 3:80 (iii) 7:5000 (iv) 8:125 (v) 23:500
8. (i) $33\frac{1}{3}\%$ (ii) 90% (iii) 5%
9. (i) 10 (ii) ₹ 180. (iii) 1 km (iv) 18 minutes
10. 250 11. 700 12. 40% 13. 40 more of 50 14. (i) 120 m² (ii) 20%

EXERCISE-8.3

1. (a) Profit ₹ 150 , 50% (b) Profit ₹ 5,500, 55%
(c) Loss ₹ 1,500 , 30% (d) Loss ₹ 120, 30%
2. (i) $6\frac{2}{3}\%$ 3. 24% Loss 4. ₹ 13,650 5. 8% Loss
6. ₹ 20,000 7. ₹ 4,750 8. ₹ 1,200
9. ₹ 2,400 10. ₹ 18,750 11. ₹ 495

EXERCISE- 9.1

1. True - (i) (ii) (iv) (vi) (vii) (viii)

2. (i) $-\frac{12}{15}$, $-\frac{16}{20}$, $-\frac{20}{25}$ etc.

(ii), (iii), (iv), (v) do yours self

3. (i) Yes (ii) No 4. (i) 40 (ii) 10

5. (i) $-2\frac{1}{2}$ (ii) $-\frac{1}{2}$ (iii) $-\frac{5}{9}$ (iv) $2\frac{3}{7}$ (v) $-\frac{9}{5}$

6. (a) $-\frac{2}{4}$ (b) $-\frac{2}{5}$ (c) $-\frac{7}{4}$ (d) $-\frac{2}{-3}$

7. (i) $0, \frac{-49}{30}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}$ (ii) $-\frac{10}{16}, \frac{-9}{16}, \frac{1}{16}, \frac{2}{16}, 0$ {You can get others also }

9. (i) $-\frac{31}{5}, 0$ 10. (i) 0 (ii) 1

EXERCISE-9.2

1. (a) $\frac{13}{16}$ (b) $-\frac{19}{42}$ (c) $-\frac{-7}{3}$
(d) $\frac{1}{9}$ (e) $\frac{-68}{105}$ (f) $\frac{-49}{30}$ (g) $-7\frac{20}{21}$

2. (i) $2\frac{2}{14}$ (ii) 1 (iii) $1\frac{8}{9}$
(iv) $-1\frac{8}{21}$ (v) $-1\frac{58}{105}$ (vi) $-7\frac{1}{9}$ (vii) $9\frac{2}{9}$

3. (i) $-\frac{5}{7}$ (ii) $\frac{6}{55}$ (iii) $\frac{1}{4}$ (iv) $-\frac{54}{55}$
(v) $\frac{+7}{78}$ (vi) $\frac{4}{5}$ (vii) $\frac{6}{7}$ (viii) $\frac{-3}{5}$

4. (i) 5 (ii) $-1\frac{2}{3}$ (iii) $1\frac{2}{3}$ (iv) -9
(v) $\frac{1}{9}$ (vi) -9 (vii) $-7\frac{1}{2}$ (viii) 1

5. (i) $\frac{8}{9}$ (ii) 1 (iii) true (iv) true
(v) true (vi) $\frac{-7}{3}$

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EXERCISE-11.1

1. (i) 70 cm^2 (iv) 13 cm
(ii) 20 cm (v) 1.05 cm
(iii) 37.50 cm^2 (vi) 5.8 deci meter
2. (i) $H = 8 \text{ cm}$ (ii) $A = 321 \text{ m}^2$
(iii) $B = 28 \text{ cm}$ (iv) 800 cm (v) 2.1 cm
5. 1.125 m^2 6. 72 m^2 7. 10 cm
8. $27 \text{ cm}^2, 7.2 \text{ cm}$ 9. (i) 30 cm^2 (ii) 4.62 (Approx) cm
10. 60 m^2 11. (i) 98 cm^2 (ii) 70 cm^2 (iii) 168 cm^2
12. 5.5 cm 13. 136 cm^2 14. 24 m
15. 1.5 cm 16. 210000 cm^2
17. $48 \text{ cm}^2, 12 \text{ cm}$ 18. 7 cm 19. 8 cm 20. 3 cm

EXERCISE-11.2

1. (a) 88 cm (b) 176 mm (c) 132 cm
2. ₹ $4,840$. 3. 25.70 cm 4. 150 rounds 5. 3846.50 cm 6. 32 mm
7. $14 \text{ cm}, 11 \text{ cm}$ 8. 92400 cm
9. 94.29 (Approx) m 10. 37.68 cm

EXERCISE-11.3

1. (i) (a) (ii) (c)
2. (a) $78.57 \text{ (Approx) cm}^2$ (b) 66.50 cm^2 (c) $95.07 \text{ (Approx) cm}^2$
3. (a) $7 \text{ cm}, 14 \text{ cm},$ (b) $5 \text{ cm}, 10 \text{ cm},$
4. ₹ 211.95 5. 3850 cm^2
6. (a) Area of square 1936 cm^2 (b) Area of circle is more than area of square by 528 cm^2 . Area of circle is 2464 cm^2
7. $13\frac{5}{7} \text{ cm}^2; 19.62 \text{ cm}^2$ 8. 210.38 cm^2

9. Radius 5 cm, Area 78.5 cm^2 10. 23.44 cm^2
 11. Perimeter $(33+21) \text{ cm}$, Area 173.25 cm^2 12. Circumference 22 cm
 13. (i) 116 m^2 , (ii) ₹ 31,360, 14. (i) $(60-1=59) \text{ m}^2$, (ii) ₹ 33,640,
 15. $24\frac{6}{7} \text{ m}^2$, 16. 24.8 m^2 , 17. (i) 63 m^2 , (ii) ₹ 12,600.

EXERCISE-12.1

1. (i) $x^2 + 2$ (ii) $a + b$ (iii) $x - 7$ (iv) $y - z$ (v) $x^2y + z$
 (vi) $\frac{1}{2}xy$ (vii) $yz - (y + z)$ (viii) $\frac{x}{y} + z$ (ix) $3x + z$
 (x) $\frac{x+6}{3}$ (xi) $(5x)^2$ (xii) $5x^2$
 2. (i) $5n + 10$ (ii) 50 3. mn

4.	Expression	Term	Factor	Tree diagram
a)	$y + 7$	y 7	y 7	
b)	$x^2 + 2x + 3$	x^2 $2x$ 3	x, x $2, x$ 3	
c)	$2x^2 + 3xy + 4y^2$	$2x^2$ $3xy$ $4y^2$	$2, x, x$ $3, x, y$ $4, y, y$	
d)	$7x + 5$	$7x$ 5	$7, x$ 5	
e)	$xy - x + 1$	xy $-x$ 1	x, y $-1, x$ 1	
f)	$3x^2y - 4xy^2$	$3x^2y$ $-4xy^2$	$3, x, x, y$ $-4, x, y, y$	

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	Expression	Term	Factor	Tree diagram
g	$3x^2 - x^2 + 1$	$3x^2$ $-x^2$ 1	$2, x, x, x$ $-1, x, x$ 1	$\begin{array}{c} 3x^2 - x^2 + 1 \\ \downarrow \quad \downarrow \quad \downarrow \\ 3 \quad 3x^2 \quad -x^2 \quad 1 \\ \swarrow \downarrow \searrow \quad \swarrow \downarrow \searrow \quad \searrow \\ x \quad x \quad x \quad -1 \quad x \quad 2 \quad 1 \end{array}$
h	$xz + z$	xz z	x, z z	$\begin{array}{c} xz + z \\ \downarrow \quad \downarrow \\ xz \quad z \\ \swarrow \downarrow \searrow \quad \searrow \\ x \quad z \quad z \end{array}$
i	$-2mn + m^2 - 3n^2$	$-2mn$ m^2 $-3n^2$	$-2, m, n$ m, n $-3, n, n$	$\begin{array}{c} -2mn + m^2 - 3n^2 \\ \downarrow \quad \downarrow \quad \downarrow \\ -2mn \quad m^2 \quad -3n^2 \\ \swarrow \downarrow \searrow \quad \swarrow \downarrow \searrow \quad \swarrow \downarrow \searrow \\ -2 \quad m \quad n \quad m \quad m \quad -3 \quad n \quad n \end{array}$
j	$-7x^2 + 3x^2y^3 + 5x^2y^2 - y$	$-7x^2$ $3x^2y^3$ $5x^2y^2$ $-y$	$-7, x, x$ $3, x, x, y, y, y$ $5, x, x, y, y$ $-1, y$	$\begin{array}{c} -7x^2 + 3x^2y^3 + 5x^2y^2 - y \\ \downarrow \quad \downarrow \quad \downarrow \quad \downarrow \\ -7x^2 \quad 3x^2y^3 \quad 5x^2y^2 \quad -y \\ \swarrow \downarrow \searrow \quad \swarrow \downarrow \searrow \quad \swarrow \downarrow \searrow \quad \swarrow \downarrow \searrow \\ -7 \quad x \quad x \quad 3 \quad x \quad x \quad y \quad y \quad y \quad 5 \quad x \quad x \quad y \quad y \quad -1 \quad y \end{array}$

5. a)

	Expression	Term which is not constant	Numerical coefficient
i	$zx + 3y$	$2x$ $3y$	2 3
ii	$mn + 3$	mn	1
iii	$2ab - a + b$	$2ab$ $-a, b$	2 -1 1
iv	$2x^2y - 4xy^2 + 7$	$2x^2y$ $-4xy^2$	2 -4
v	$3x^3 - 7x^2 + y$	$3x^3y$ $-7x^2$ y	3 -7 1

(b)

	Expression	Term having factor	Coefficient of x
i	xy^3+1	xy^3	1
ii	$2x+y+1$	$2x$	2
iii	$3xy^2+xy+x$	$3xy^2, xy, x$	3, 1, 1
iv	$7xz-z$	$7xz$	7
v	$y-x+z$	$-x$	-1

(c)

	Expression	Terms having b^2	Coefficient of b^2
(i)	ab^2+9	ab^2	a
(ii)	ab^2+a^2b+3a	ab^2	a
(iii)	$-b^2+3a^2b-5b^2$	$-b^3; -5b^2$	$-b; -5$

6. (i) Binomial (ii) monomial (iii) Monomial (iv) Trinomial (v) Binomial

(vi) Binomial (vii) Binomial (viii) Trinomial (ix) Binomial (x) Monomial

7.(a)(i) Like term (ii) Unlike term (iii) Like term (iv) Unlike term (v) Unlike term

(vi) Like term (vii) Unlike term (viii) Like term (ix) Like term (x) Like term

(b) $ab^2, 7ab^2, -ab^2, 3ab^2 \rightarrow$ Like term

$xy^2, 4xy^2 \rightarrow$ Like term

$-2x, 3x, 40x \rightarrow$ Like term

$y^3, 3y^3 \rightarrow$ Like term

$a^2b^2, 2a^2b^2 \rightarrow$ Like term

$m^2n, -m^2n \rightarrow$ Like term

EXERCISE- 12.2

1. (i) $-5x + 9y - 40$ (ii) $3x^2+2x+y^2+y^3$ (iii) $3a-6$

(iv) $-2x^2 + y + 5xy^2 - 2y^3 + 5$ (v) $10z^2 + 6$

2. (i) $10-x^2y$ (ii) $3x+4xy-1$ (iii) 0 (iv) $-2x+9y+5xy+9$

(v) $13xy + 3xz + 5yz$ (vi) $2x^2+y^2+9$ (vii) $2x^2y^2-xy+x-1$

(viii) $2y^2+3yz+2z^2+1$

3. (i) $12-x^2y$ (ii) $5xy$ (iii) $x^2+5xy^2+3y^2$ (iv) $7x^2y^2-xy+2$

ANSWERS

- (v) $-2m^2+5m+3r-1$ (vi) $-2p^2+4pq-2q^2$ (vii) $-p^2+2-8$
 (viii) $-x^2-7x-2$
4. $4x^2-3x-6$ (5) $-5x+y+6$ (6) $6x-2$ (Assuming age of Anima as x)
7. x^2-9x-4 (8) $-x^2+5x-9$ (9) $\frac{3}{2}x+\frac{4}{3}y$
10. $4x^2+2x-2$ (Assuming the number of marble with Nabin as x)

EXERCISE-12.3

1. (i) 3 (ii) 0 (iii) 1 (iv) $\frac{-7}{2}$ (v) 2
2. (i) -18 (ii) 18 (iii) -35 (iv) -8 (v) $-\frac{1}{3}$
3. (i) 1 (ii) 2 (iii) 0 (iv) 1 (v) 2 (vi) 1
4. (i) $2x^2+2x+6; 10$ (ii) $5x+3; 3$ (iii) $x+1; -1$ (iv) $3x^2+2x-1; 7$
 (v) $x^3+4x^2+z+1; 7$ (vi) $x^3-4x+20; 20$
5. (i) $5x-y; 13$ (ii) $xy+yz+2x; 1$
 (iii) $3x^2y-xy^2z-3xyz; -60$ (iv) $-10x+8y+z+7; -38$
 (v) $3x+4y+z-3; -10$
6. $p = -5$

EXERCISE-12.4

1. (i) 16, 21, 26, 251, 501
 (ii) 5, 11, 14, 149, 299
 (iii) 5, 10, 26, 2501, 10001
 (iv) 7, 11, 103
 (v) 7, 11, 15, 19, 399
2. 4 squares can be drawn from a vertex of a heptagon.
 In a polygon having n - sides, from a single vertex $(n-3)$ number of squares can be drawn
3. (a) 25, n^2 (b) 16, $3n+1$ (c) 18, $2(n+3)$

EXERCISE – 13.1

1. (i) (a) -1 (ii) (b) 625
2. (i) 5^5 (ii) $3^2 \times 2^3$ (iii) $(-2)^3 \times 3^4$ (iv) $b^5 \times c^3$ (v) $a^3 \times b^2 \times c^5$
3. (i) 128 (ii) -128 (iii) 729 (iv) 729 (v) 8192
(vi) 675 (vii) -1125
4. (i) 7^3 (ii) 3^6 (iii) 3^7 (iv) $(-3)^7$ (v) 5^5
(vi) $(-5)^5$
5. (i) $2^2 \times 5^2$ (ii) $2^2 \times 3 \times 5^2$ (iii) $2^3 \times 5^3$ (iv) $2^2 \times 3^3 \times 5^2$
(v) $3^4 \times 5$ (vi) $2^6 \times 5^2$
6. (i) $<$ (ii) $=$ (iii) $=$ (iv) $<$ (v) $<$ (vi) $>$
7. (i) $m = 5$ $n = 4$ 8. $m = 3$ $n = 4$

EXERCISE – 13.2

1. (i) 3^{22} (ii) 2^8 (iii) 1 (iv) 3^{14}
(v) 2^7 (vi) $\frac{7^2 \times 5^7}{3}$ (vii) $\frac{5 \times 3^2}{2}$
(viii) 2^4 (ix) 2×3 or (6) (x) $2 \times 5 \times 7$ or (70) (xi) 1
2. (i) $2^8 \times 3$ (ii) 3^6 (iii) $2^7 \times 5^4$ (iv) $2^6 \times 3^6$ (v) $2^3 \times 5^3$
3. (i) $2 \times 3^2 - a^5 \times b^{14}$ (ii) $a^{mp+pn-p} \times b^{np+mn-p}$ (iii) $a^{16} \cdot b^{14} \cdot c^2$
4. $m = 4$
5. (i) False (ii) False (iii) True (iv) False
(v) False (vi) False

EXERCISE – 13.3

1. (i) 5.273294×10^6 (ii) 7.10021×10^5 (iii) 6.4×10^9
(iv) 1.8129×10^4 (v) 2.396132×10^6 (vi) 7.5×10^{10}
(vii) 7.001×10^{10} (viii) 4.50269×10^4 (ix) 3.20619×10^3
(x) 4.75×10^{11}

ANSWERS

2. (i) 1.7371×10^3 km (ii) 6.7771×10^6 m (iii) 5.029×10^7 km
(iv) 7.2042×10^8 (v) 9.4607×10^{12} (vi) 1.496×10^8 km
(vii) 7.349×10^{22} kg (viii) 6.9551×10^5 (ix) 1.386×10^9 km³
(x) 2.99792458×10^8 meter/second
3. (i) $5.761 \times 10^{16} > 5.76 \times 10^{17}$ (ii) $343.6 \times 10^{19} > 0.03436 \times 10^{17}$

EXERCISE - 14.1

1. (i) Leaf of taro plant, (ii) Leaf of pipal, (iii) Leaf of brinjal, (iv) Leaf of pumpkin (v) Leaf of jasmine. (The students can cite other example also.)
2. (i) Dish, (ii) Bowl, (iii) Glass, (iv) plate, (v) Karahi (The students can cite other example also.)
4. Scelene triangle 5. 6 nos 6. Innumerable
7. Two nos 8. The symmetrical shapes are (ii), (iii), (iv), (vii), (viii)
The non- symmetrical shapes are (i), (v), (vi), (ix)

EXERCISE - 14.2

1. The order of rotational symmetry% (i) 1, (ii) 2, (iii) 2, (iv) 4, (v) 3, (vi) 8,
(vii) 1, (viii) 2, (ix) 1, (x) 5, (xi) 6, (xii) 3
2. (i) The middle point of the upper and lower part of the figure is the center of rotation. Rotational angle is 180° , order of sysmmetry is 2,
(ii) The middle point of the three parts is the center rotation and angle of rotation is 120° , order of symmetry is 3.
(iii) The middle point is the center of rotation. Angle of rotation is 45° , order of symmetry is 8

EXERCISE - 14.3

1. Rhombus and Rectangle 2. Equilateral triangle 3. Parallelogram
4. Kite 5. There is no such triangle which has 2 order of rotational symmetry.
6. Order of rotational symmetry of 'S' is 2. There is no linear symmetry of 'S'
7. Order of rotational symmetry of '3' is 1. Line of symmetry is 1.
8. Order of rotational symmetry of '6969' is 2. There is no linear symmetry of '6969'

9. The figure will be same to look at on the angle of rotation of 120° , 240° and 360° . So the order of rotational symmetry is 3
10. Regular pentagon is the shape which has rotational angle 72° and order of rotational symmetry is more than 1
11. There is no such shape which has rotational angle of 17° and order of rotational symmetry is more than 1
12. Complete the table given below :

Shape	Location of Center of Rotation	Angles of rotation	order of rotational symmetry
Rectangle	The point of intersection of two diagonals	180° , 360°	2
Square	The point of intersection of two diagonals	90° , 180° , 270° , 360°	4
Rhombus	The point of intersection of two diagonals	180° , 360°	2
Parallelogram	The point of intersection of two diagonals	180° , 360°	2
Trapezium	The point of intersection of two diagonals (other point can be taken)	360°	1
Regular Pentagon	The point of intersection of diagonals	72° , 144° , 216° , 288° , 360°	5
Equilateral Triangle	The point of perpendicular bisector and arm	120° , 240° , 360°	3
Isosceles	Any point on the triangle	360°	1
Scalene	Any point on the triangle	360°	1
Circle	Center of the circle	Innumerable	Innumerable
Semicircle	Any point on the semicircle	360°	1

EXERCISE-15.1

1. Two dimensional – Circle, Rectangle, quadrilateral
Three dimensional– sphere, pyramid, pencil box, marble, cube, matchbox
2. sphere, football, orange, (The student can cite other examples also) 3. One

EXERCISE-15.2

3. Ball 4. Cuboid; Length 3 cm, Breath 3 cm, Height 9 cm

EXERCISE-15.3

1. 4 Nos of cube
2. 16 Nos, Length 8 cm, Breath = 4, Height = 4 cm

Playing With Number

1. 142857 is an interesting number. We can have lots of mathematical fun with this number.

Lets play with this numbers

- (i) Where 7 is multiplied with 142857 we get
 $142857 \times 7 = 999999$
- (ii) When the numbers 142857 is grouped with there digit numbers as shown and add we get.
 $142 + 857 = 999$
- (iii) When the digits of 142857 are arranged is ascending and discending order and add we get
 $124578 + 875421 = 999999$
- (iv)
- (v) The addition of the digits of 142857 is 27 and numbers is 14285 division by 27.

2. Pelindromine number is a number that remains same where its digits are

$11^2 = 121$	$11^3 = 1331$
$111^2 = 12321$	$111^3 = 1367631$
$1111^2 = 1234321$	$11^4 = 14641$
_____ Try yourself	$202^2 =$ Try yourself

$101^2 = 10201$
 $10101^2 = 102030201$
 $1001^2 = 1002001$
 $1001001^2 =$ _____ Try yourself

Where the addition of the digits of a two digit number is 10 and the numbers is multiplied by 99, 999, 9999 there the number is called palindromine numbers.

$19 \times 99 = 1881$	$19 \times 999 = 18981$
$28 \times 99 = 2772$	$28 \times 999 = 27972$
$37 \times 99 = 3663$	$37 \times 999 = 36963$
$46 \times 99 = 4554$	Try yourself _____
$55 \times$ _____ 5445	$19 \times 9999 = 189981$
$64 \times$ _____ Try yourself	$28 \times 9999 = 279972$
$73 \times$ _____ Try yourself	$37 \times 9999 = 369963$

82 × _____ Try yourself

91 × _____ Try yourself

Try yourself _____

$$19 \times 99999 = 1899981$$

$$28 \times 99999 = 2799972$$

Try yourself _____

☆ The opposite or reverse of the prime numbers between 10 and 1000 are as follows :

11 → 11,	13 → 31,	17 → 71,
37 → 73,	79 → 97,	101 → 101,
107 → 701,	113 → 311,	157 → 751,
167 → 761,	179 → 971,	181 → 181,
191 → 191,	337 → 733,	347 → 743,
353 → 353,	359 → 953,	373 → 373,
383 → 383,	389 → 983,	709 → 907,
727 → 727,	739 → 937,	759 → 759,
769 → 967,	787 → 787,	797 → 797,
919 → 919,	929 → 929,	

There are 12 pairs of prime numbers in between 10 and 1000.

☆ There are some numbers of which added the number we get is just reverse when we multiply the same number

$9 + 9 = 18$	$9 \times 9 = 81$
$24 + 3 = 27$	$24 \times 3 = 72$
$47 + 2 = 49$	$47 \times 2 = 94$
$497 + 2 = 499$	$497 \times 2 = 994$

Find out more

☆ Likewise the square of a particular number is just reverse in order when we consider the square of the same number in reserve.

$12^2 = 144$	$21^2 = 441$
$13^2 = 169$	$31^2 = 961$
$112^2 = 12544$	$211^2 = 44521$

Try

☆ Look at the following example. Here we also see that the multiplication of two numbers is just reverse in order when we change the order of the given two numbers.

$$312 \times 221 = 68952$$

$$213 \times 122 = 25986$$

☆ If the thousand's place of a four digits number is bigger then unit place and hundreth's place is smaller then unit place then.

Playing with numbers

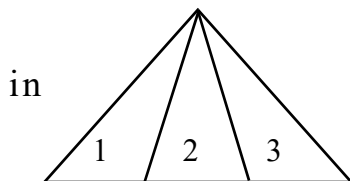
$$\begin{array}{r}
 7362 \\
 - 2637 \\
 \hline
 4725 \\
 + 5274 \\
 \hline
 9999
 \end{array}$$

This way you can try a number of similar pattern.

- ☆ Let's see when the digit of ten thousand's place is bigger than one's place in a number and the digit of hundred's place and thousand's place is equal—

$$\begin{array}{r}
 94467 \\
 - 76449 \\
 \hline
 18018 \\
 + 81081 \\
 \hline
 99099
 \end{array}$$

Let's find the number of triangles



Look at the figure. Can you count the total number of triangles in the figure.

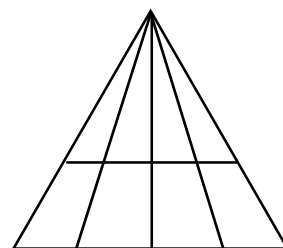
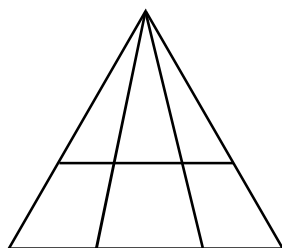
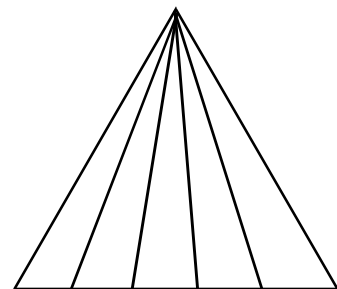
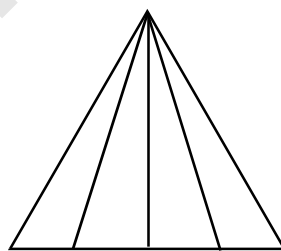
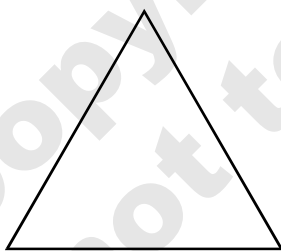
Name the triangles 1, 2 and 3 as shown in the figure.

$$1 + 2 + 3 = 6$$

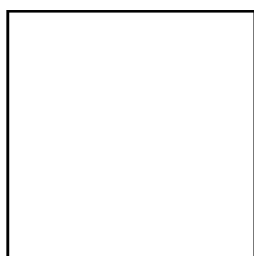
You will find 6 triangles in the figure.

The total number of triangles $1 + 2 + 3 = 6$

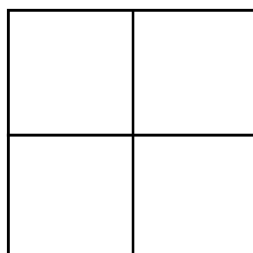
Find out the total number of triangles from the following figures



Let us find the numbers of square :



No part 1 square



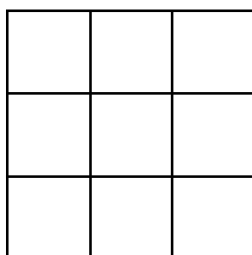
2 Parts by length and breadth each

☆ 4 units squares

☆ 1 square combine with 4 unit squares

∴ Total square = $4 + 1 = 5$

Formula = $2^2 + 1^2 = 5$



9 Parts by length and breadth each

☆ 9 units square

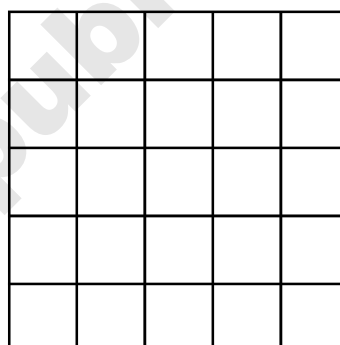
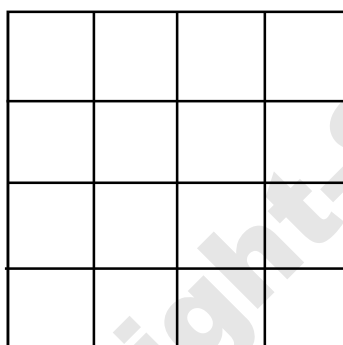
☆ 4 squares combine with 4 squares

☆ 1 squares combine with 9 squares

∴ Total squares = $9 + 4 + 1 = 14$

Formula = $3^2 + 2^2 + 1^2 = 14$

Find out the total number of squares :

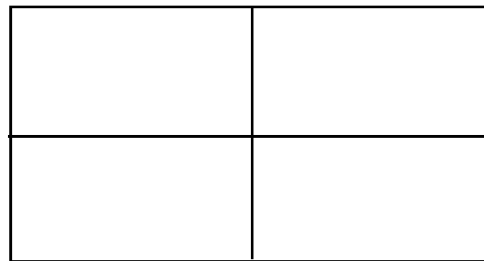


Let us find the numbers of rectangles :



No part

The number = Rectangle of 1



The parts by length and breadth each

☆ 4 units rectangle

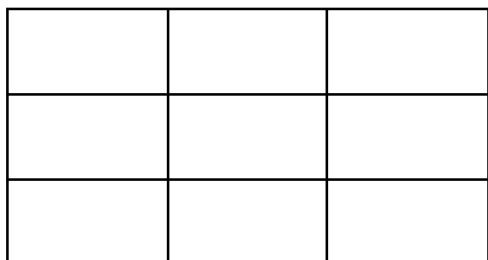
☆ 4 rectangles combine with 2 rectangles

1 rectangle combine with 4 rectangle

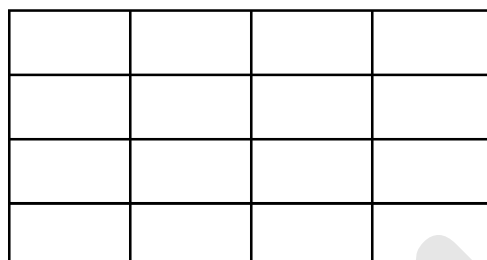
= $4 + 4 + 1 = 9$

Formula = $(1 + 2)^2 = 3^2 = 9$

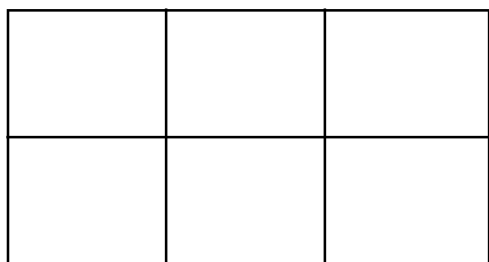
Playing with numbers



Find the total number of rectangles



Find the total number of rectangles



3 parts by length, 2 parts by breadth

☆ 6 units rectangles

☆ Rectangles combine with 2 rectangles = $4 + 3 = 7$

☆ Rectangles combine with 3 rectangles = 2

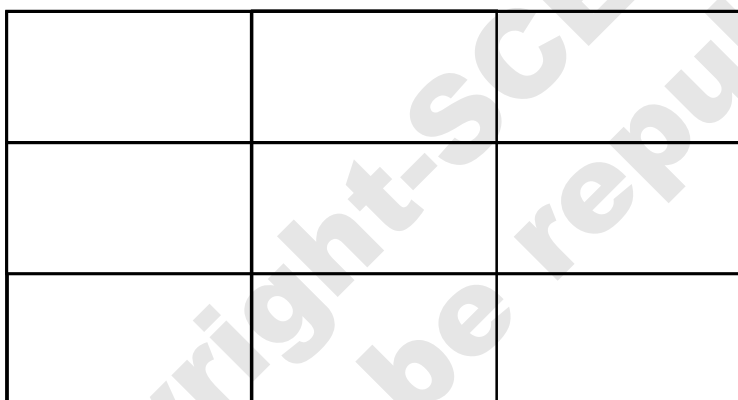
☆ Rectangles combine with 4 rectangles = 2

☆ Rectangles combine with 6 rectangles = 1

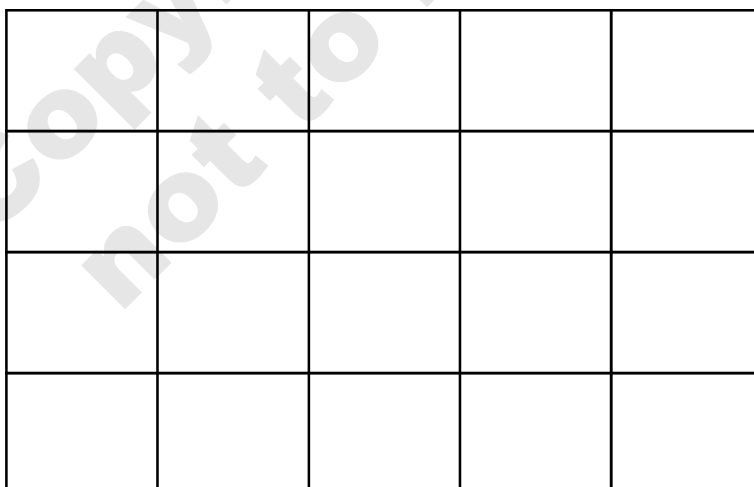
∴ Total number of rectangles

$$= 6 + 7 + 2 + 2 + 1 = 18$$

$$\text{Formula} = (1 + 2 + 3) (1 + 2) = 6 \times 3 = 18$$



Find out the total number of rectangles



Find out the total number of rectangles

Fill in the gaps :

- (i) $999 \times 1 = 0999$ (ii) $9999 \times 1 = 09999$
 $999 \times 2 = 1998$ $9999 \times 2 = 19998$
 $999 \times 3 = 2997$ $9999 \times 3 =$
 $999 \times 4 = 3 \text{ --- } 6$ $9999 \times 4 =$
 $999 \times 5 = \text{---} \text{---} 5$ $9999 \times 5 =$
 $999 \times 6 = \text{---} \text{---} \text{---}$ $9999 \times 6 =$
 $999 \times 7 = \text{---} \text{---} \text{---}$ $9999 \times 7 =$
 $999 \times 8 = \text{---} \text{---} \text{---}$ $9999 \times 8 =$
 $999 \times 9 = 8991$ $9999 \times 9 =$

- (iii) 256×432

			4	3	2	
			0	0	0	2
			8	6	4	
		2	0	1	1	5
		2	4	1	1	0
				8	2	6
11	0	5	9	2		

Therefore,
 $256 \times 432 = 110592$
 This method of multiplication is known as

Multiply by *Gomutrika* method :

- (i) 916×623 (ii) 457×156

Fun with subtraction :

- ☆ Subtract 123456789 from 987654321. What you will find? Is there all digit present 2 from 1 to 9

☆ Fun with division :

$$333 \ 333 \div 3003$$

$$666 \ 666 \div 6006$$

What you will find ? Find out the prime factor of each. Here do not you get the prime factors 7, 11, 13 for each?

☆ Fun with Multiplication :

Multiply 123456789 by 9, 18, 27, 36, 45, 54, 63, 72, 81 respectively and arranged the product.

Learning outcomes in mathematics for Class - VII

The learner :

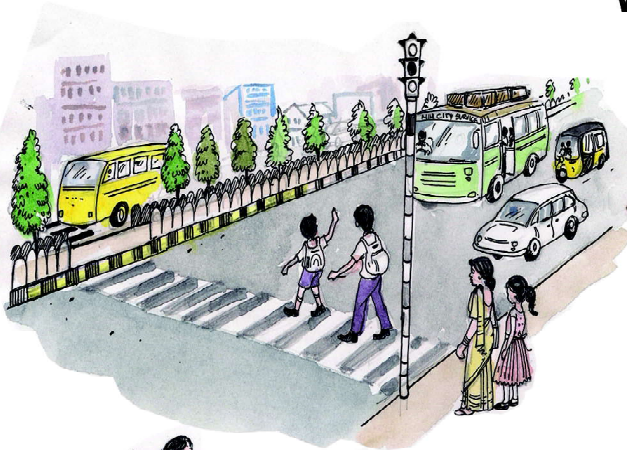
- multiplies/divides two integers.
- interprets the division and multiplication of fractions.

for example interprets $\frac{2}{3} \times \frac{5}{4}$ as $\frac{2}{3}$ of $\frac{4}{5}$. Also $\frac{1}{2} + \frac{1}{4}$ is interpreted as how many $\frac{1}{4}$ make $\frac{1}{2}$?

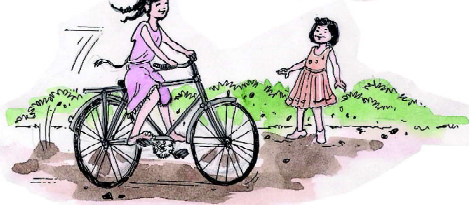
- uses algorithms to multiply and divide fractions/decimals.
- solves problems related to daily life situations involving rational numbers.
- uses exponential form of numbers to simplify problems involving multiplication and division of large numbers.
- represents daily life situations in the form of a simple equation and solves it.
- adds/subtracts algebraic expressions.
- distinguishes quantities that are in proportion. For example, tells that 15, 45, 40, 120 are in proportion as $\frac{15}{45}$ is the same as $\frac{40}{120}$
- solves problems related to conversion of percentage to fraction and decimal and vice versa.
- calculates profit/loss percent and rate percent in simple interest.
- classifies pairs of angles based on their properties as linear, supplementary, complementary, adjacent and vertically opposite and finds value of the one when the other is given.
- verifies the properties of various pairs of angles formed when a transversal cuts two lines.
- finds unknown angle of a triangle when its two angles are known.
- explains congruency of triangles on the basis of the information given about them like (SSS, SAS, ASA, RHS)
- using ruler and a pair of compasses constructs, a line parallel to a given line from a point outside it and triangles.
- finds out approximate area of closed shapes by using unit square grid/graph sheet
- calculates areas of the regions enclosed in a rectangle and a square
- finds various representative values for simple data from her/his daily life contexts like mean, median and mode
- recognises variability in real life situation such as, variations in the height of students in her class and uncertainty in happening of events like throwing a coin
- interprets data using bar graph such as consumption of electricity is more in winters than summer, runs scored by a team in first 10 owners etc.
- discuss the situations where the terms "chance" can be used.

A few precautionary measures to be taken in order to avoid road accidents

While walking on the road—

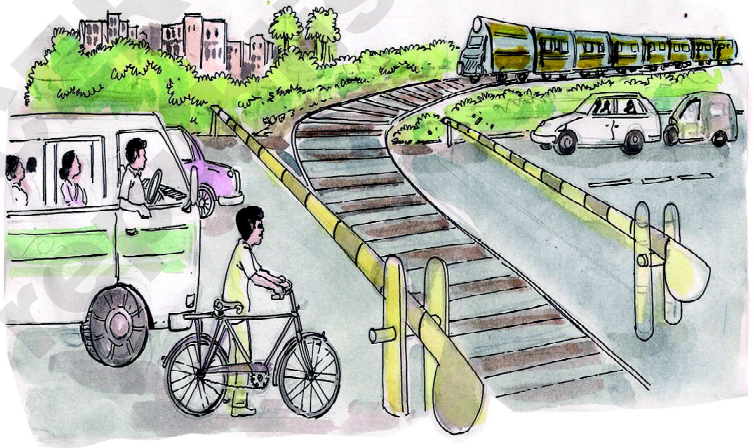


- Always walk on your left side
- While crossing the road always look to your right and left and then cross.
- Walk on the footpath if there is one.
- At zebra crossing cross the road walking over the zebra lines.
- Use torchlight at night.
- Don't ride a bicycle carrying a pillion rider



While crossing the railway level crossing—

- Don't cross the gate at the railway level crossing when it is closed.
- Don't cross the railway lines till the train passes.
- Don't cross the railway lines till both the gates of the railway level crossing are opened.



While travelling by bus —

- Board the bus carefully.
- Don't spit outside.
- If there are lots of passengers make a queue and then board the bus.
- Don't travel by standing on the foot-board of the bus.
- Don't put your hands and legs or head outside the window.

- Alight from the bus when it stops properly.
- While alighting from the bus look to your right and left properly.



It is our responsibility and duty to help the children the old or the physically disabled persons walking on the road or crossing the road.

Let's build a clean Assam

One step toward transparency



Clean life Healthy life
My life is the life of the nation



Garbage should be disposed in dustbins or in a hole. Keeping the locality and surroundings clean is as important as keeping our houses and our school clean.