

NOTE : Dear students ,

We are sending these extra questions with solutions from the three lessons which we have taught . These are for your practice . Simply don't copy the sums . Plz try to understand and solve . All of you are requested to solve these in the same notebook , in which you have done the exercises . Children this is definitely going to help you for your assessment which you are going to have very soon .

SUBJECT ENRICHMENT ACTIVITY { SEA }

Children along with this PDF we are giving you your SEA which you have to complete during your summer holidays :

A] Draw and colour atleast 5 convex polygons and five concave polygons and mention the reasons,why they are concave or convex .

B] Draw and colour different kinds of quadrilaterals (with diagonals) and write their properties neatly .

[SEA CAN BE DONE IN THE SAME NOTEBOOK]

THANK YOU AND STAY BLESSED

STAY HOME STAY SAFE TAKE CARE

HAPPY HOLIDAYS.

Important Questions
Chapter 1 – Rational Numbers

Question (1 – 8)

1 – Mark:

1. The additive inverse of $\frac{3}{4}$ is ____

Solution: $-\frac{3}{4}$

2. Multiplicative inverse of is $\frac{1}{8}$

Solution: 8

3. A Rational number between 3 and 4 is ____

Solution: $\frac{3+4}{2} = \frac{7}{2}$

4. Reciprocal of -2 is ____

Solution: $-\frac{1}{2}$

5. Zero has ____ reciprocal

Solution: No

6. Reciprocal of a negative number is ____

Solution: Negative

7. Whole numbers start from ____

Solution: Zero

8. There are ____ rational numbers between 3 and 4.

Solution: Countless or Infinite.

Question (9 – 15)

2 – Marks:

9. Sum of two numbers is $\frac{3}{4}$, one of the number is $\frac{1}{8}$. Find the other one.

Solution: Let the other number be x

$$x + \frac{1}{8} = \frac{3}{4}$$

$$x = \frac{3}{4} - \frac{1}{8}$$

$$x = \frac{6-1}{8} \quad [LCM = 8]$$

$$x = \frac{5}{8}$$

10. Simplify $\left(\frac{-8}{13}\right) + \left(\frac{-3}{26}\right)$

Solution:

$$\Rightarrow -\frac{8}{13} - \frac{3}{26}$$

$$\Rightarrow -\frac{16}{26} - \frac{3}{26} \quad [LCM = 26]$$

$$= -\frac{19}{26}$$

11. What number to be multiplied with $\frac{1}{4}$ so as to get the product as $-\frac{5}{16}$

Solution: Let the number be x

The product can be $= \frac{1}{4} \times x$

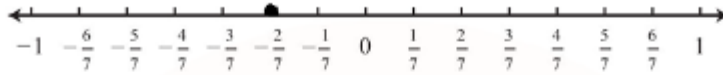
$$\text{Product} = -\frac{5}{16}$$

$$-\frac{5}{16} = \frac{1}{4} \times x$$

$$\therefore x = -\frac{5}{4}$$

12. Represent $-\frac{2}{7}$ on the number line.

Solution:



13. Divide $\frac{1}{2}$ by $\left[-\frac{1}{3} + \frac{2}{5}\right]$

Solution: $\frac{1}{3} + \frac{2}{5} = \frac{-5+6}{15} = \frac{1}{15}$ [LCM = 15]

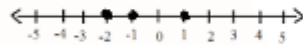
$$\frac{1}{2} \div \frac{1}{15}$$

$$\Rightarrow \frac{1}{2} \times \frac{15}{1}$$

$$\text{Hence, } \frac{15}{2}$$

14. Find three rational number between -4 and 4 . Represent them on line.

Solution: The three rational numbers are $-2, -1, 1$



15. Define by example of addition

(a) Associative Property

Solution: Associative Property :

$$(7+9) = (9+7)$$

$$7+9 = 16 \text{ \& } 9+7 = 16$$

The property states that you can add or multiply regardless of how the numbers are grouped.

Question (16 – 19) 3 – Marks:

16. Simplify $\left[\frac{6}{7} + \frac{3}{8} - \frac{1}{2}\right] \div \frac{4}{3}$ and find its reciprocal.

Solution: $\left[\frac{6 \times 8 + 3 \times 7 - 56}{56} \right] \times \frac{4}{3}$ (since the LCM of terms inside bracket = 56)

$$\left[\frac{48 + 21 - 56}{56} \right] \times \frac{4}{3}$$

$$\frac{13}{56} \times \frac{4}{3} = \frac{13}{42}$$

Reciprocal of $\frac{13}{42}$ is $1 + \frac{13}{42} = 1 \times \frac{42}{13}$

$$= \frac{42}{13}$$

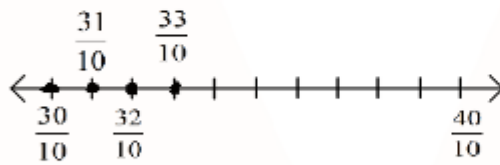
17. Find three Rational Number between 3 and 4. Represent them on Number line.

Solution:

3 can be written as $3 \times \frac{10}{10} = \frac{30}{10}$

4 can be written as $4 \times \frac{10}{10} = \frac{40}{10}$

Three Rational Numbers are $\frac{31}{10}, \frac{32}{10}, \frac{33}{10}$



18. Use Appropriate property and find $-\frac{1}{6} \times \frac{4}{7} + \frac{1}{2} - \frac{3}{7} \times \frac{1}{6}$

Solution: $-\frac{1}{6} \times \frac{4}{7} + \frac{1}{2} - \frac{3}{7} \times \frac{1}{6}$

$$\begin{aligned} & -\frac{1}{6} \times \frac{4}{7} - \frac{3}{7} \times \frac{1}{6} + \frac{1}{2} \quad [\text{associative property } a+b=b+a] \\ & -\frac{1}{6} \times \frac{4}{7} - \frac{1}{6} \times \frac{3}{7} + \frac{1}{2} \\ & -\frac{1}{6} \left[\frac{4}{7} + \frac{3}{7} \right] + \frac{1}{2} \\ & -\frac{1}{6} \times \frac{7}{7} + \frac{1}{2} \\ & \frac{-1+3}{6} = \frac{2}{6} \\ & = \frac{1}{3} \end{aligned}$$

19. Find the multiplicative inverse of following

(a) $\frac{1}{6}$

(b) $-\frac{3}{8}$

(c) $\frac{4}{19}$

Solution:

(a) $6: \frac{1}{6} \times x = 1 \Rightarrow x = 6$

(b) $-\frac{8}{3}: -\frac{3}{8} \times x = 1 \Rightarrow x = -\frac{8}{3}$

(c) $\frac{19}{4}: \frac{4}{19} \times x = 1 \Rightarrow x = \frac{19}{4}$

Question (20 – 22)

4 or 5 Marks:

20. Find three Rational number between $\frac{3}{6}$ and $\frac{3}{4}$

Solution: The mean of two Rational number is a Rational number

$$\frac{3}{6} = \frac{1}{2} \text{ and } \frac{3}{4}$$

$$\text{Mean} = \frac{\frac{1}{2} + \frac{3}{4}}{2} = \frac{\frac{5}{4}}{2} = \frac{5}{8}$$

$$\frac{1}{2} < \frac{5}{8} < \frac{3}{4}$$

Now Mean of $\frac{1}{2}$ and $\frac{5}{8}$

$$\Rightarrow \frac{\frac{1}{2} + \frac{5}{8}}{2} = \frac{\frac{9}{8}}{2} = \frac{9}{16}$$

$$\frac{1}{2} < \frac{9}{16} < \frac{5}{8}$$

Mean of $\frac{5}{8}$ and $\frac{3}{4}$

$$\Rightarrow \frac{\frac{5}{8} + \frac{3}{4}}{2} = \frac{5+6}{8 \times 2} = \frac{11}{16}$$

$$\therefore \frac{5}{8} < \frac{11}{16} < \frac{3}{4}$$

Hence the three rational numbers are $\frac{9}{16}, \frac{5}{8}, \frac{11}{16}$

21.

(a) Find Reciprocal of $-\frac{1}{2}$

(b) Additive inverse of $\frac{4}{9}$

(c) Multiplicative inverse of $\left[\frac{1}{6} + \frac{4}{9}\right] \times \frac{4}{3}$

Solution:

(a) Reciprocal of $-\frac{1}{2}$ is -2 .

$$\text{As } \frac{1}{-\frac{1}{2}} = -2$$

(b) Additive inverse of $\frac{4}{9}$ is $-\frac{4}{9}$

$$\frac{4}{9} + x = 0$$

$$x = -\frac{4}{9}$$

(c) Multiplicative inverse of $\left[\frac{1}{6} + \frac{4}{9}\right] \times \frac{4}{3}$

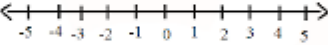
$$= \left[\frac{1}{6} + \frac{4}{9}\right] \times \frac{4}{3}$$

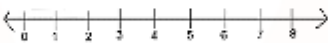
$$= \frac{(3+8)}{18} \times \frac{4}{3}$$

$$= \frac{11}{18} \times \frac{4}{3}$$

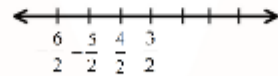
$$= \frac{22}{27}$$

22. Match the correct

(a) Whole number (i) 

(b) Natural number (ii) 

(c) Integer (iii) 

(d) Rational Number (iv) 

Solution:

(a) (ii)

(b) (iii)

(c) (i)

(d) (iv)

Important Questions
Chapter 2 – Linear Equations in One Variable

Question (1 – 10)

1 – Mark:

1. A _____ is a statement of equality of two algebraic expressions involving one or more unknown quantities called variables.

Solution: Equation

2. An equation involving only linear polynomials is called a _____.

Solution: Linear equation

3. If $\frac{ax+b}{cx+d} = \frac{p}{q}$ then, $q(ax+b) = p(cx+d)$ This process is called _____.

Solution: Cross multiplication

4. Any term of an equation may be taken to other side with a change in its sign. This process is called _____.

Solution: Transposing

5. Any equation of the type $ax + b = 0$ where $a \neq 0$ is called a _____ in variable x .

Solution: Linear equation

6. Any value of the variable which satisfies the equation is called _____ of equation.

Solution: Solution

7. We can add the _____ to both sides of equation.

Solution: Non zero same number

8. We can divide both sides of an equation by the same _____ number.

Solution: Non zero

9. $x = 1$ is the solution for $4(x + 5) = 24$. Say true or false.

Solution: True

10. Which of the following is not a linear equation in one variable?

(a) $3y + 2 = 0$

(b) $3y - 4 = y$

(c) $p + 2q = 7$

(d) $2(x - 3) + 7 = 0$

Solution:

Option (c) is not a linear equation because $p + 2q = 7$ has two variables p and q .

Question (11 – 14)

2 – Marks:

11. Solve $14x = 40 + 9x$

Solution:

$$14x = 40 + 9x$$

$$14x - 9x = 40 \text{ (by transposing)}$$

$$5x = 40$$

$$x = \frac{40}{5}$$

$$x = 8$$

12. Solve $\frac{4}{6}x + 2 = \frac{7}{3}$

Solution: $\frac{4}{6}x + 2 = \frac{7}{3}$

$$\frac{4}{6}x = \frac{7}{3} - 2$$

$$\frac{2}{3}x = \frac{7-6}{3}$$

$$\frac{2}{3}x = \frac{1}{3}$$

$$x = \frac{1}{3} \times \frac{3}{2}$$

$$x = \frac{1}{2}$$

13. Solve for y and check the solution $\frac{y+1}{2y+3} = \frac{3}{8}$

Solution: $\frac{y+1}{2y+3} = \frac{3}{8}$

$$8(y+1) = 3(2y+3)$$

$$8y+8 = 6y+9$$

$$8y-6y = 9-8$$

$$2y = 1$$

$$y = \frac{1}{2}$$

Verification :

By substituting value of $y = \frac{1}{2}$

$$\text{LHS} = \frac{\frac{1}{2}+1}{2\left(\frac{1}{2}\right)+3}$$

$$= \frac{3}{1+3}$$

$$= \frac{3}{4} = \frac{3}{2} \times \frac{1}{2}$$

$$= \frac{3}{8}$$

$$= \text{RHS}$$

Hence verified

14. Solve $\frac{p+1}{p-1} = \frac{2p+3}{2p-5}$

Solution:

$$(p-1)(2p+3) = (p+1)(2p-5)$$

$$p(2p+3) - 1(2p+3) = p(2p-5) + 1(2p-5)$$

$$2p^2 + 3p - 2p - 3 = 2p^2 - 5p + 2p - 5$$

$$2p^2 + p - 3 = 2p^2 - 3p - 5$$

$$2p^2 + p - 2p^2 + 3p = -5 + 3$$

$$4p = -2$$

$$p = -\frac{2}{4}$$

$$p = -\frac{1}{2}$$

Question (15 – 17)

3 – Marks:

15. $\frac{2}{4}x + \frac{1}{3}x = x - 8$. Solve for x.

Solution:

$$\frac{2}{4}x + \frac{1}{3}x = x - 8$$

$$x \left[\frac{2}{4} + \frac{1}{3} \right] = x - 8$$

$$x \left[\frac{6+4}{12} \right] = x - 8$$

$$\frac{10x}{12} = x - 8$$

$$\frac{5x}{6} - x = -8$$

$$x \left[\frac{5-6}{6} \right] = -8$$

$$x \left[-\frac{1}{6} \right] = -8$$

$$\frac{x}{6} = 8$$

$$x = 8 \times 6$$

$$x = 48$$

16. Two numbers are in ratio 10 : 16. If the sum of numbers is 572. Find the numbers.

Solution: Let the numbers be 10x, 16x

As per given,

$$10x + 16x = 572$$

$$26x = 572$$

$$x = \frac{572}{26} = \frac{286}{13}$$

$$x = 22$$

Hence the numbers are

$$10x = 10 \times 22 = 220$$

$$16x = 16 \times 22 = 352$$

Verification:

$$10x + 16x = 220 + 352 = 572$$

Hence the result is also verified.

17. The sum of three consecutive multiples of 3 is 867. Find the numbers.

Solution: Let the three consecutive numbers be $x, x+3, x+6$

By given,

$$x + x + 3 + x + 6 = 867$$

$$3x + 9 = 867$$

$$3x = 867 - 9$$

$$3x = 858$$

$$x = \frac{858}{3}$$

$$x = 286$$

Question (18 – 22) 4 – Marks:

18. Solve for x : $\frac{x+6}{4} + \frac{x-3}{5} = \frac{5x-4}{8}$

Solution:

$$\frac{x+6}{4} + \frac{x-3}{5} = \frac{5x-4}{8}$$

$$\frac{5(x+6) + 4(x-3)}{20} = \frac{5x-4}{8}$$

$$\frac{5x+30+4x-12}{20} = \frac{5x-4}{8}$$

$$\frac{9x+12}{20} = \frac{5x-4}{8}$$

$$8(9x+12) = 20(5x-4)$$

$$72x+96 = 100x-80$$

$$100x-72x = 96+80$$

$$28x = 176$$

$$x = \frac{176}{28} = \frac{88}{14}$$

$$x = \frac{44}{7}$$

19. Solve for y : $\frac{3y+5}{2y+1} = \frac{2}{6}$

Solution: $\frac{3y+5}{2y+1} = \frac{2}{6}$

$$6(3y+5) = 2(2y+1)$$

$$18y+30 = 4y+2$$

$$18y - 4y = 2 - 30$$

$$14y = -28$$

$$y = \frac{-28}{14}$$

$$y = -2$$

20. Ram's father is 26 years younger than Ram's grandfather and 29 years older than Ram.

The sum of the ages of all three is 135 years. What is the age of each one of them?

Solution: Let Ram's present age be x years.

Ram's father's present age = $(x+29)$ years

Ram's grandfather's age = $(x+29+26)$ years

We know sum of all three ages is 135 years.

$$\text{Hence } x + (x+29) + (x+29+26) = 135$$

$$3x + 29 + 29 + 26 = 135$$

$$3x = 135 - 84 = 51$$

$$x = \frac{51}{3}$$

$$x = 17$$

Hence Ram's present age $x = 17$ years

Ram's father's present age = $(x+29)$

$$= 17 + 29$$

$$= 46 \text{ years}$$

Ram's grandfather's age = $(x+29+26)$

$$= 46 + 26$$

$$= 72 \text{ years}$$

21. The sum of digits of two digit number is 12. If 18 is added to it, the digits are reversed.

Find the number.

Solution:

Let the unit's digit be x

As the sum of both digits is 12, the ten's place is $12 - x$

Therefore, the number = $(12 - x) \times 10 + x$

By reversing the new number formed = $x \times 10 + (12 - x)$

As per given information

$$x \times 10 + (12 - x) = (12 - x) \times 10 + x + 18$$

$$10x + 12 - x = 120 - 10x + x + 18$$

$$9x + 12 = -9x + 138$$

$$18x = 126$$

$$x = 7$$

Hence the original number is 57.

22. The breadth of a parallelogram is $\frac{2}{3}$ rd its length. If the perimeter is 150 metres. Find the

dimensions of the parallelogram.

Solution: Let x be the length

$$\text{Breadth} = \frac{2}{3} \text{ of length} = \frac{2}{3}x$$

Perimeter of parallelogram = 150m

$$\text{Perimeter} = 2(l + b)$$

$$150 = 2\left(x + \frac{2}{3}x\right)$$

$$150 = 2x + \frac{4}{3}x$$

$$\left[\frac{6+4}{3}\right]x = 150$$

$$\frac{10}{3}x = 150$$

$$x = \frac{150 \times 3}{10}$$

$$x = 45$$

$$\text{Length} = 45, \text{ breadth} = \frac{2}{3} \times 45 = 30$$

Question (23 – 23)

5 – Marks:

23. The denominator of a fraction exceeds its numerator by 4. If the numerator and denominator are both increased by 3, the new fraction becomes $\frac{4}{5}$. Find the original fraction.

Solution:

Let the numerator of the original fraction is x .

Hence denominator = $x + 4$

$$\text{Hence fraction} = \frac{x}{x+4}$$

Now, when both numerator and denominator are increased by 3

$$\frac{x+3}{x+4+3} = \frac{4}{5}$$

$$\frac{x+3}{x+7} = \frac{4}{5}$$

By Cross Multiplication, $5(x+3) = 4(x+7)$

$$5x+15 = 28-15$$

$$x = 13$$

$$\text{Hence the original fraction} = \frac{x}{x+4} = \frac{13}{13+4} = \frac{13}{17}$$

Important Questions
Chapter 3 – Understanding Quadrilaterals

Question (1 – 7) 1 – Mark:

1. Regular polygon have all sides _____

Solution: Equal

2. Sum of all internal angles of a quadrilateral is _____

Solution: 360°

3. Diagonals of Rectangle are _____ and _____ each other.

Solution: Equal, Bisect

4. A quadrilateral with one pair of sides parallel is _____

Solution: Trapezium

5. Diagonals of _____ bisect each other at 90°

Solution: Rhombus and square

6. A parallelogram with one angle 90° is _____

Solution: Rectangle

7. The number of Diagonals in triangle is _____

Solution: zero

Question (8 – 13) 2 – Marks:

8. Find x in the figure



Solution: Sum of all internal angles of quadrilateral = 360°

$$30 + 120 + 90 + x = 360^\circ$$

$$240 + x = 360^\circ$$

$$x = 120^\circ$$

9. Find the sum of all internal angle of a pentagon that is regular.

Solution:

10. State true or false

(a) All squares are rectangles

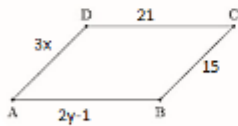
(b) All Rhombus are kites

Solution:

(a) True

(b) True

11. In the following figure, given a parallelogram ABCD. Find x and y



Solution: Since in Parallelogram ABCD opposite sides are parallel and equal

$$AB = CD$$

$$\Rightarrow 2y - 1 = 21$$

$$\Rightarrow 2y = 22$$

$$\Rightarrow y = 11$$

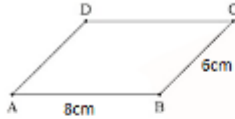
$$AD = CB$$

$$\Rightarrow 3x = 15$$

$$\Rightarrow x = 5$$

12. Length of two adjacent sides of parallelogram are 8cm and 5cm. Find its perimeter

Solution:



Let the parallelogram be ABCD

Let $AB = 8\text{cm}$ and $BC = 6\text{cm}$

$AB = CD$ [since opposite sides of parallelogram are equal and parallel]

$CD = 8\text{cm}$

Similarly $BC = AD$

$AD = 6\text{cm}$

Perimeter of parallelogram = sum of lengths of all sides

$$= 2(AB + CD)$$

$$= 2(6 + 8)$$

$$= 2(14)$$

$$= 28$$

13. Find sum of angles of a regular pentagon(internal angles).

Solution: By formula we know

$$\text{Sum of all angles} = n(180) - 2 \times 180^\circ \quad [n = 5]$$

$$= 5(180) - 360^\circ$$

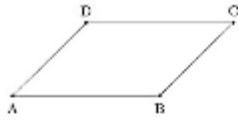
$$= 900 - 360^\circ$$

$$= 540^\circ$$

Question (14 – 18) 3 – Marks:

14. The measure of two adjacent angles of a parallelogram is in the ratio of 3 : 7. Find the measure of each angles of the parallelogram.

Solution: Let the parallelogram be ABCD



Let

$$\angle A : \angle B = 3 : 7$$

$$\angle A = 3x \text{ \& } \angle B = 7x$$

[ABCD is a parallelogram and $AD \parallel BC$]

$$\angle A + \angle B = 180^\circ$$

$$3x + 7x = 180^\circ$$

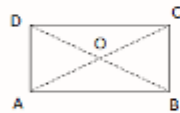
$$10x = 180^\circ$$

$$x = 18^\circ$$

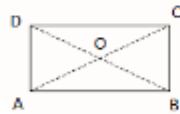
$$\therefore \angle A = \angle C = 3x \text{ \& } \angle B = \angle D = 7x$$

$$\therefore \angle A = \angle C = 54^\circ \text{ \& } \angle B = \angle D = 126^\circ$$

15. In the given figure ABCD is a rectangle and its diagonal meet at O. Find x, if $OA = 2x$ and $OD = 6x - 8$. Also find BD.



Solution:



Given, $Oa = 2x$ and $OD = 6x - 8$

Since diagonals of Rectangle are equal

$$AC = BD \dots (i)$$

Since Rectangle is a parallelogram and diagonals of parallelogram bisect each other.

$$OD = OB \text{ and } OA = OC \dots (ii)$$

$$AC = OA + OC \text{ [Hence, } AC = 2(OA) \text{ using (ii)]}$$

$$BD = BO + OD \text{ [Hence, } BD = 2(OD) \text{ using (ii)]}$$

$$AC = BD$$

$$2(OA) = 2(OD)$$

$$OA = OD$$

$$2x = 6x - 8$$

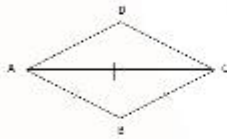
$$4x = 8$$

$$x = 2$$

$$OD = 6x - 8 = 6(2) - 8 = 4$$

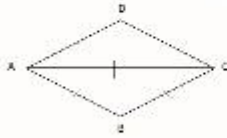
$$BD = 8 \quad [\because BD = 2(OD)]$$

16. The diagonal AC of Rhombus ABCD is equal to one of its side BC. Find all the angles of Rhombus.



Solution:

Let ABCD be the Rhombus and according to the question $AC = AB = BC$ [given]



In $\triangle ABC$, $AD = AC = BC$

$\triangle ABC$ is an equilateral triangle

$$\angle ABC = 60^\circ$$

$$\angle ADC = 60^\circ \quad [\text{opposite angles}]$$

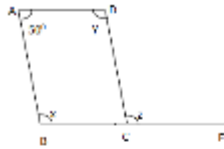
$$\angle D + \angle A = 180^\circ \quad [\text{supplementary angles of parallelogram}]$$

$$\angle A = 180^\circ - 160^\circ$$

$$\angle A = 120^\circ$$

$$\angle A = \angle C = 120^\circ \quad [\text{Opposite angles}]$$

17. Find the values of x , y and z . Where ABCD is a Parallelogram.



Solution:

$$\angle A = 50^\circ$$

$$\angle A + \angle D = 180^\circ \text{ [supplementary angles]}$$

$$\angle A + y = 180^\circ$$

$$y = 180^\circ - 50^\circ$$

$$y = 130^\circ$$

$$\angle y = \angle x \text{ [opposite angles of parallelogram]}$$

$$y = x = 130^\circ$$

$$\angle DCB + z = 180^\circ \text{ [linear pair]}$$

$$z = 180^\circ - \angle DCB$$

$$z = 180^\circ - 50^\circ$$

$$z = 130^\circ$$

18. Explain how square is

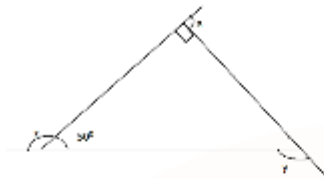
- (a) Quadrilateral
- (b) Rhombus
- (c) Rectangle

Solution:

- (a) A Quadrilateral is a closed polygon of 4 sides and square is following the definition of a quadrilateral. Hence square is a quadrilateral.
- (b) A Rhombus is a parallelogram whose adjacent sides are equal. Similarly square have the same property. Hence a square is a Rhombus.
- (c) A Rectangle is a parallelogram with one angle 90° . Square has all angles 90° . Square has all the properties of a rectangle. Hence square is a Rectangle.

Question (19 – 22) 4 – 5 Marks:

19. Find $x + y + z$ in the following figure.



Solution: Let's name it as A, B, C, D, E, F



$$\angle ACB + z = 180^\circ \text{ [linear pair]}$$

$$50^\circ + z = 180^\circ$$

$$z = 130^\circ$$

$$\angle FCB + \angle ACB = 180^\circ \text{ [linear pair]}$$

$$x + 90^\circ = 180^\circ$$

$$x = 90^\circ$$

$$y = \angle BAC + \angle BCA \text{ [Exterior angle prop.]}$$

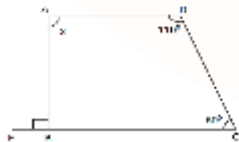
$$y = 50^\circ + 90^\circ$$

$$y = 140^\circ$$

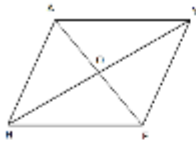
$$\therefore x + y + z = 140^\circ + 90^\circ + 130^\circ = 360^\circ$$

20.

(a) Find x in the figure



(b) Figure HEYA shown below is a parallelogram its given OE = 3cm and HY is 7 more than AE. Find OH



Solution:

(a) $\angle ABE = 90^\circ$

$$\angle ABE + \angle ABC = 180^\circ \text{ [linear pair]}$$

$$\angle ABC = 180^\circ - 90^\circ$$

$$\angle ABC = 90^\circ$$

$$\therefore \angle ABC + \angle BCD + \angle D + \angle A = 360^\circ \text{ [sum of all angles]}$$

$$90^\circ + 60^\circ + 110^\circ + x = 360^\circ$$

$$260^\circ + x = 360^\circ$$

$$x = 100^\circ$$

(b) $HY = 7$ more than AE (given)

$$HY = 7 + AE$$

$$OE = 3\text{cm and}$$

$$AE = 2(OE) \text{ [O is the bisector of the diagonals]}$$

$$AE = 2(3)$$

$$AE = 6\text{cm}$$

$$HY = 7 + 6$$

$$HY = 13\text{cm}$$

$$HY = OH + OY \text{ [since } OH = OY \text{ as diagonals of parallelogram bisect each other]}$$

$$HY = 2(OH)$$

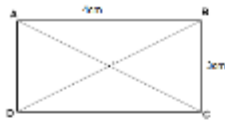
$$13 = 2(OH)$$

$$OH = \frac{13}{2} = 6.5\text{cm}$$

21.

(a) Name the quadrilateral with exactly one pair of sides parallel.

(b) Find the length of BD in the given Rectangle

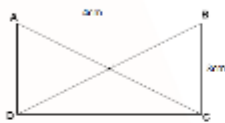


Solution:

(a) Trapezium $AB \parallel CD$



(b)



In $\triangle ABC$

$AB = 4\text{cm}$

$BC = 3\text{cm}$

$\angle ABC = 90^\circ$

$AB^2 + BC^2 = AC^2$ [pythagoras theorem]

$(4)^2 + (3)^2 = AC^2$

$AC^2 = 25$

$AC = 5\text{cm}$

Diagonals of Rectangle are equal

$AC = BD$

$BD = 5\text{cm}$.

22. Choose the quadrilaterals with their properties

Quadrilaterals	Properties
(a) Parallelogram	(i) Opposite sides equal
(b) Rhombus	(ii) Opposite angles equal
(c) Rectangle	(iii) diagonals bisect each other
(d) Square	(iv) diagonals are perpendicular to each other
(e) Kite	

	(v) each angle is a right angle (vi) diagonals are equal (vii) one of the diagonal bisects the other
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Solution:

(a) – (i), (ii), (iii)

(b) – (i), (ii), (iii), (iv)

(c) – (i), (ii), (iii), (v), (vi)

(d) – (i), (ii), (iii), (iv), (v), (vi)

(e) – (vi), (iv)