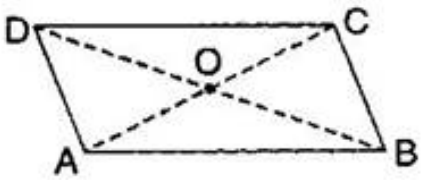
NCERT solutions for class 8 Maths Understanding Quadrilaterals Ex-3.3

Q1. Given a parallelogram ABCD. Complete each statement along with the definition or property used.



(i) AD = _____

(ii) $\angle$DCB = _____

(iii) OC = _____

(iv) $m\angle$DAB + $m\angle$CDA = _____

Ans: (i) AD = BC

[Since opposite sides of a parallelogram are equal]

(ii) $\angle$DCB = $\angle$DAB

[Since opposite angles of a parallelogram are equal]

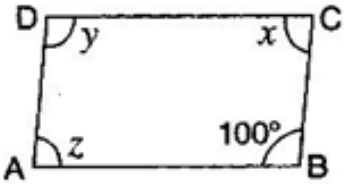
(iii) OC = OA

[Since diagonals of a parallelogram bisect each other]

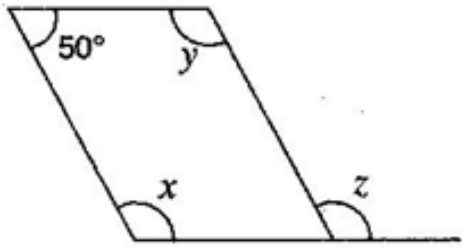
(iv) $m\angle$DAB + $m\angle$CDA = 180°

[Adjacent angles in a parallelogram are supplementary]

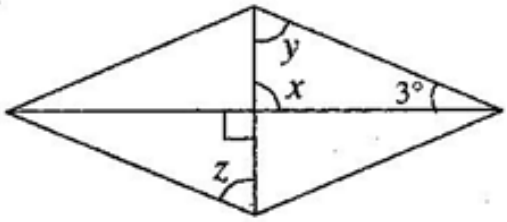
Q2. Consider the following parallelograms. Find the values of the unknowns x, y, z.



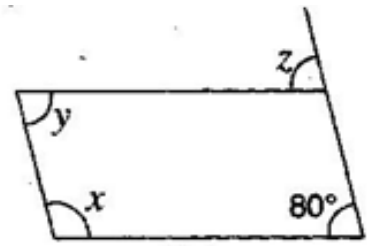
(i)



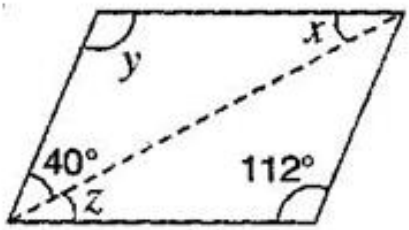
(ii)



(iii)



(iv)

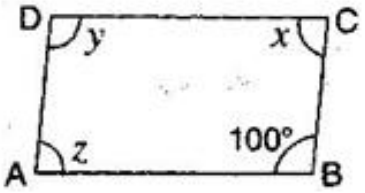


(v)

Note: For getting correct answer, read $3^{\circ} = 30^{\circ}$ in figure (iii)

Ans: (i) $\angle B + \angle C = 180^{\circ}$

[Adjacent angles in a parallelogram are supplementary]



$\Rightarrow 100^{\circ} + x = 180^{\circ}$

$\Rightarrow x = 180^{\circ} - 100^{\circ} = 80^{\circ}$

And $z = x = 80^{\circ}$

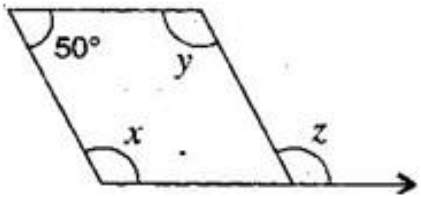
[Since opposite angles of a parallelogram are equal]

Also $y = 100°$

[Since opposite angles of a parallelogram are equal]

(ii) $x + 50° = 180°$

[Adjacent angles in a $\parallel$gm are supplementary]



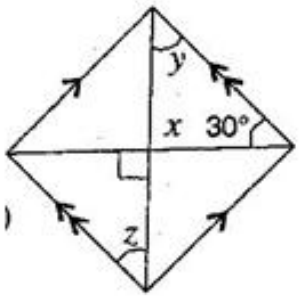
$\Rightarrow x = 180° - 50° = 130°$

$\Rightarrow z = x = 130°$

[Corresponding angles]

(iii) $x = 90°$

[Vertically opposite angles]



$\Rightarrow y + x + 30^\circ = 180^\circ$

[Angle sum property of a triangle]

$\Rightarrow y + 90^\circ + 30^\circ = 180^\circ$

$\Rightarrow y + 120^\circ = 180^\circ$

$\Rightarrow y = 180^\circ - 120^\circ = 60^\circ$

$\Rightarrow z = y = 60^\circ$

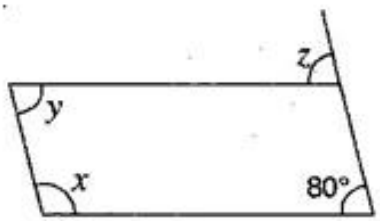
[Alternate angles]

(iv) $z = 80^\circ$

[Corresponding angles]

$\Rightarrow x + 80^\circ = 180^\circ$

[Adjacent angles in a $\parallel$ gm are supplementary]



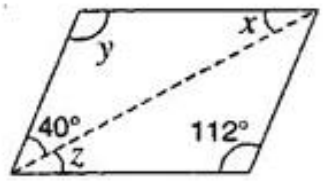
$\Rightarrow x = 180° - 80° = 100°$

And $y = 80°$

[Opposite angles are equal in a $\parallel$gm]

(v) $y = 112°$

[Opposite angles are equal in a $\parallel$gm]



$\Rightarrow 40° + y + x = 180°$

[Angle sum property of a triangle]

$\Rightarrow 40° + 112° + x = 180° \Rightarrow 152° + x = 180°$

$\Rightarrow x = 180° - 152° = 28°$

And $z = x = 28°$

[Alternate angles]

Q3. Can a quadrilateral ABCD be a parallelogram, if:

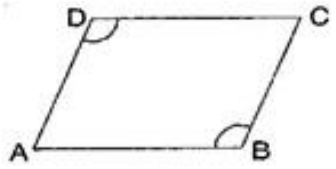
(i) $\angle D + \angle B = 180°$?

(ii) AB = DC = 8 cm, AD = 4 cm and BC = 4.4 cm?

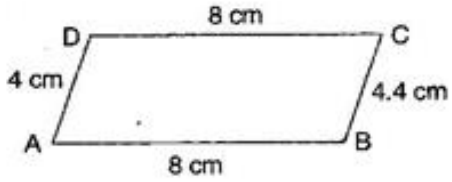
(iii) $\angle A = 70°$ and $\angle C = 65°$?

Ans: (i) $\angle D + \angle B = 180°$

It can be, but here, it needs not to be.

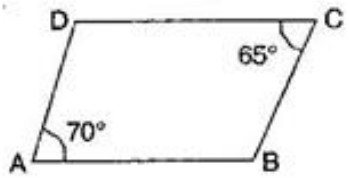


(ii) No, in this case because one pair of opposite sides are equal and another pair of opposite sides are unequal. So, it is not a parallelogram.



(iii) No. $\angle A \neq \angle C$.

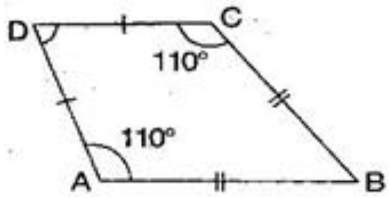
Since opposite angles are equal in parallelogram and here opposite angles are not equal in quadrilateral ABCD. Therefore it is not a parallelogram.



Q4. Draw a rough figure of a quadrilateral that is not a parallelogram but has exactly two opposite angles of equal measures.

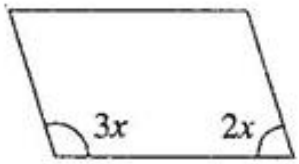
Ans: ABCD is a quadrilateral in which angles $\angle A = \angle C = 110°$.

Therefore, it could be a kite.



Q5. The measure of two adjacent angles of a parallelogram are in the ratio 3 : 2. Find the measure of each of the angles of the parallelogram.

Ans: Let two adjacent angles be $3x$ and $2x$.



Since the adjacent angles in a parallelogram are supplementary.

$\therefore 3x+2x=180°$

$\Rightarrow 5x=180°$

$\Rightarrow x=\frac{180°}{5}=36°$

$\therefore$ One angle = $3x=3\times36°=108°$

And Another angle = $2x=2\times36°=72°$

Q6. Two adjacent angles of a parallelogram have equal measure. Find the measure of the angles of the parallelogram.

Ans: Let each adjacent angle be x.

Since the adjacent angles in a parallelogram are supplementary.

$\therefore x+x=180°$

$\Rightarrow 2x=180°$

$\Rightarrow x=\frac{180°}{2}=90°$

Hence, each adjacent angle is $90°$.

********** END **********