

MBA PRO 2024

QUANTITATIVE APTITUDE

DPP:08

Quadrilaterals 1

Q1 Three angles of a quadrilateral measures 49° , 119° , and 76° . Calculate the measure of the fourth angle in degree?

Q2 The angles of a quadrilateral are in the ratio of $4 : 3 : 4 : 5$. Find the measure of the largest angle in degrees.

- (A) 111.5 (B) 112.5
(C) 113.5 (D) 114.5

Q3 Arun draw a quadrilateral JKLM in which O is a point inside the quadrilateral and OK, OJ are the angle bisector of $\angle K$ and $\angle J$ then which of the following is true?

- (A) $\angle JOK = (\angle M + \angle L) \times 1/2$
(B) $\angle JOK = \angle J + \angle K$
(C) $\angle JOK = (\angle M + \angle L)$
(D) None of these.

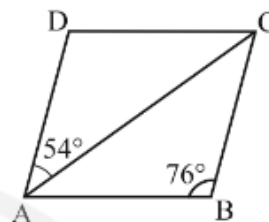
Q4 Arun drawn a parallelogram in which, opposite angles are $2x + 40$ and $4x - 50$. What will be the measure of each of the other two angles in degrees.

Q5 Gerry draw a parallelogram JKLM, in which the angle bisector of $\angle J$ and $\angle K$ meet at point O on side ML then which of the statement is true if $\angle J = 50^\circ$?

- (A) $MJ = MO$
(B) $OL = LK$
(C) $OL = JK$
(D) Both (a) and (b)

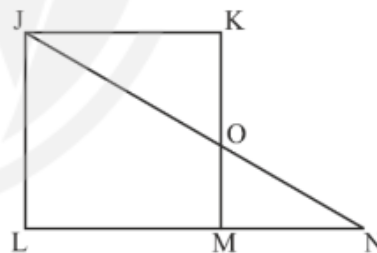
Q6

In the given figure, $ABCD$ is a parallelogram in which $\angle B = 76^\circ$ and $\angle DAC = 54^\circ$. Find the sum of $\angle DCA$ and $\angle ACB$.



- (A) 50°
(B) 54°
(C) 76°
(D) 104°

Q7 In the given figure, JKML is a parallelogram LM and JO are produced to meet at point N . If O is the midpoint of KM then which of the following is True



- (A) $JK = MN$
(B) $LN = 2LM$
(C) both (a) and (b)
(D) none of these

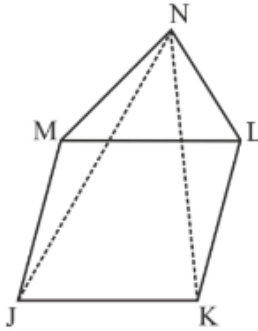
Q8 Which of the following is/are true.

1. In parallelogram, Diagonals are equal.
2. In parallelogram, Diagonal bisect each other.
3. In parallelogram, Diagonal Intersect each other at 90° .



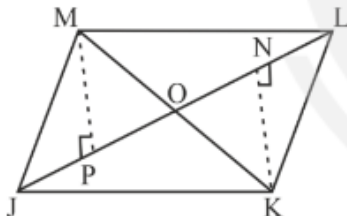
- (A) Only (1) is true
 (B) Only (2) is true.
 (C) Only (3) is true
 (D) Only 2 and 3 are true.

Q9 Shivam draw a figure in which a square is surmounted by an equilateral triangle then which of the following is true.



- (A) $\angle JMN = \angle KLN = 150^\circ$
 (B) $\triangle JMN = \triangle KLN$
 (C) $JK = KL = LN = MJ = MN$
 (D) All of These

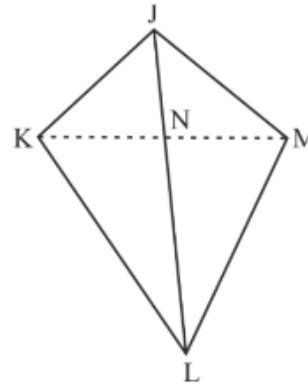
Q10 Sanjeev draw a figure in which JKLM is a quadrilateral MP and KN are perpendicular to JL. If $MP = NK$ then which of the following is true.



- (A) $OM = OK$
 (B) $OP = ON$
 (C) $\angle PMO = \angle NKO$
 (D) All of these.

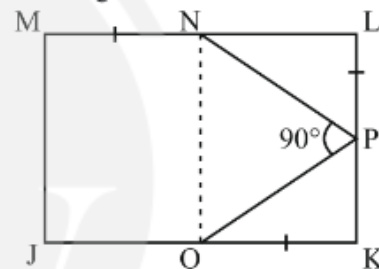
Q11 Shivam draws a figure which is a quadrilateral as shown in figure. If $JK = JM$ and

$KL = LM$ then which of the following is true.



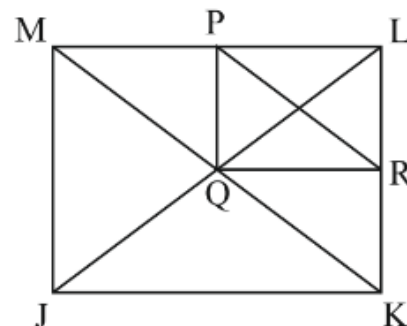
- (A) $\angle JKL = \angle JML$
 (B) $KN = NM$
 (C) JL Bisect $\angle J$ and $\angle L$
 (D) All of these

Q12 JKLM is a square, if $OK = LP = MN$ then which of the following is/are true.



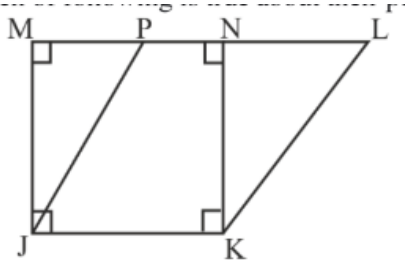
- (A) $\angle PNO = \angle PON$
 (B) $PK = LN$
 (C) $OP = PN$
 (D) All of these

Q13 In the following figure, JKLM and PQRL are rectangle if $JL = 12\text{cm}$ then find PR if Q is the midpoint of JL.



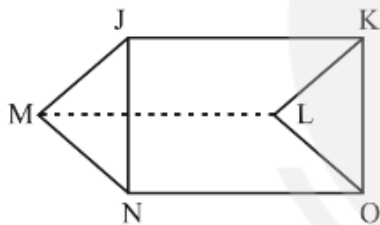
- (A) $4cm$ (B) $6cm$
 (C) $8cm$ (D) $6.5cm$

Q14 Ashwani draw a $\parallel gm$ JKLP and a rectangle JKNM on the same base JK and have same areas then which of following is true about their perimeter.



- (A) Perimeter of $\parallel gm$ > Perimeter of rectangle.
 (B) Perimeter of Rectangle > Perimeter of $\parallel gm$.
 (C) Perimeter of Rectangle = Perimeter of $\parallel gm$.
 (D) None of these.

Q15 Sumit draw a figure by using three $\parallel gm$ JKLM, MNOL, JKON. If area of $\triangle JMN = 9.6cm^2$ then find the area of $\triangle KLO$.

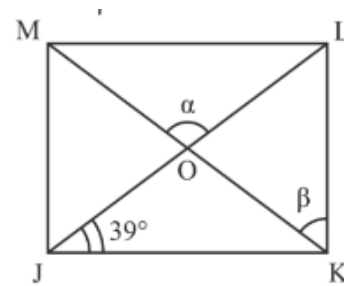


- (A) $4.8cm$ (B) $9.6cm^2$
 (C) $96cm^2$ (D) $6.4cm^2$

Q16 If the length of each side of a rhombus is 26 and the length of one of its diagonals is 20 then find the length of other diagonal.

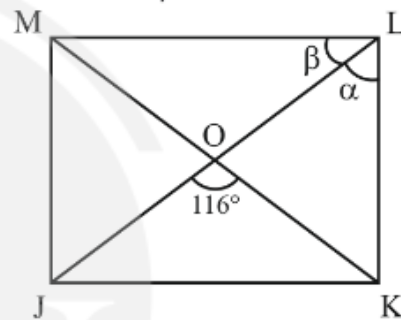
- (A) $24cm$ (B) $48cm$
 (C) $24cm$ (D) $20cm$

Q17 In the given figure JKLM is a rectangle. Find the sum of α and β .



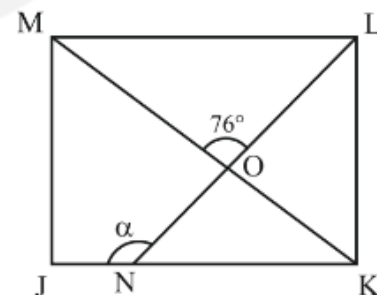
- (A) 150°
 (B) 151°
 (C) 152°
 (D) 153°

Q18 In the given figure JKLM is a rectangle. Find the difference α and β (in degrees)



- (A) 26 (B) 27
 (C) 28 (D) 29

Q19 In the figure, JKLM is a square in which LN cuts JK at N and MK at O. Find the value of α if $\angle MOL = 76^\circ$.

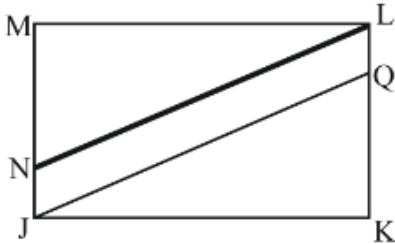


- (A) 120°
 (B) 121°
 (C) 119°
 (D) 118°



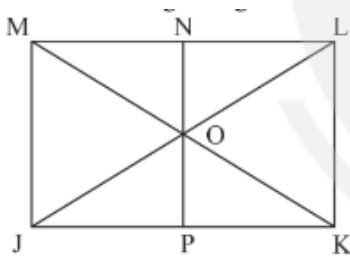
Q20 JKLM is a $\parallel gm$ in which the bisector of $\angle J$ and $\angle K$ intersect at a point O which is inside the $\parallel gm$. Find $\angle JOK$ in degrees.

Q21 In the following figure JKLM is a $\parallel gm$. If N and Q are points on MJ and LK respectively. If NJ and LQ is equal to one third of MJ and LK respectively then NJQL is a :-



- (A) Square (B) Rectangle
(C) Rhombus (D) Parallelogram

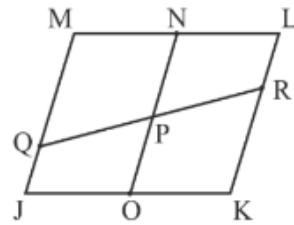
Q22 In the following figure JKLM is a $\parallel gm$ in which diagonal MK and LJ intersect each other at O . A line NOP is drawn which cuts ML at N and JK at P . Then what is true regarding ON and OP .



- (A) $ON > OP$
(B) $OP > ON$
(C) $ON + OP = OK$
(D) $ON = OP$

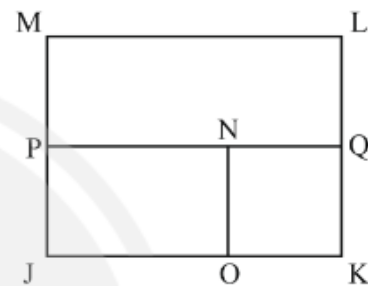
Q23 In this figure, JKLM is a $\parallel gm$ in which N and O are act as a midpoint of ML and JK respectively. If we draw a line segment QR which cuts MJ at Q and LK at R then which of the following

is true?



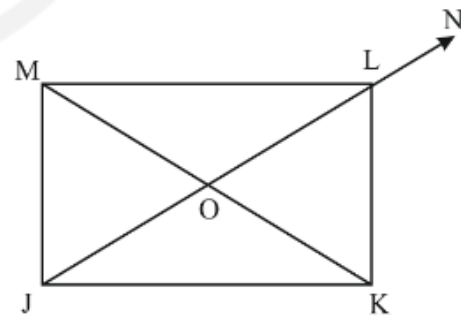
- (A) $QP = PR$ (B) $QP > PR$
(C) $QP < PR$ (D) None of these

Q24 In the given figure, JKLM and JONP are parallelogram and $\angle L = 60^\circ$ then find the value of $\angle PNO$.



- (A) 60°
(B) 120°
(C) 30°
(D) 90°

Q25 In the given figure, JKLM is a rectangle in which diagonal JL is produced to N and $\angle NLM = 139^\circ$. Find the value of $\angle JOK$.

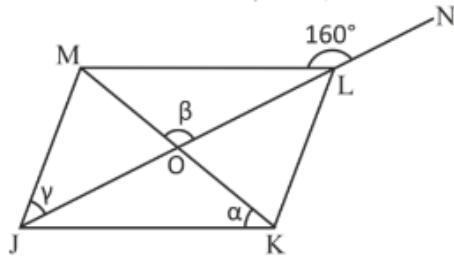


- (A) 96° (B) 97°
(C) 98° (D) 99°

Q26 Kunal draw a Rhombus as shown in figure. Diagonal JL is produced to N where

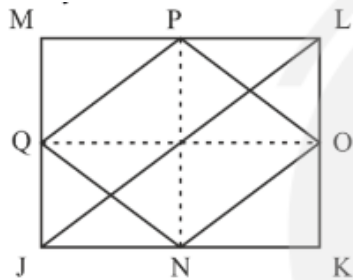


$\angle MLN = 160^\circ$ then find the sum of α, β and γ .



- (A) 110°
- (B) 90°
- (C) 160°
- (D) 180°

Q27 In the given figure, JKLM is a quadrilateral and P, Q, N, O are midpoint of ML, MJ, JK, LK respectively. What is true?

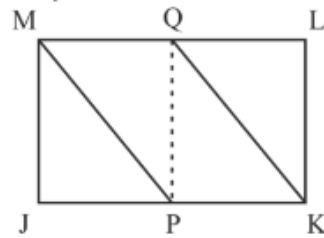


- (A) PN and OQ bisect each other
- (B) $ON = QP$
- (C) OPQN is a $\parallel gm$
- (D) All of these

Q28 The perimeter of a $\parallel gm$ is $32cm$. The longer side is $10cm$ find the length of shorter side in cm .

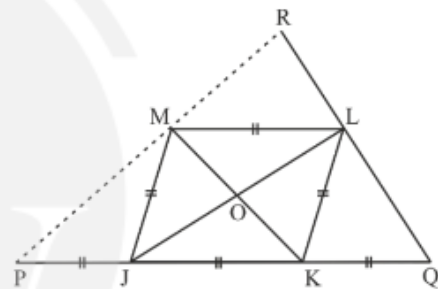
Q29 Suresh draw a $\parallel gm$ JKLM in which the sides JK and ML of a parallelogram JKLM are bisected at P and Q respectively. Then which of the

following is true.



- (A) PKQM is a $\parallel gm$
- (B) $PK = QM$
- (C) Both (a) and (b)
- (D) None of these

Q30 A math's teacher draw a Rhombus called JKLM in which PJKQ is a straight line where $PJ = KJ = KQ$. On extending P to R and Q to R as shown in figure then find the value of $\angle PRQ$ in degree.



Answer Key

Q1 116
Q2 (B)
Q3 (A)
Q4 50
Q5 (D)
Q6 (D)
Q7 (C)
Q8 (B)
Q9 (D)
Q10 (D)
Q11 (D)
Q12 (D)
Q13 (B)
Q14 (A)
Q15 (B)

Q16 (B)
Q17 (D)
Q18 (A)
Q19 (B)
Q20 90
Q21 (D)
Q22 (D)
Q23 (A)
Q24 (A)
Q25 (C)
Q26 (D)
Q27 (D)
Q28 6
Q29 (C)
Q30 90



Hints & Solutions

Q1 Text Solution:

We know that the sum of all angles of a quadrilateral is equal to 360° .

Let the fourth angle be x .

$$x + 49 + 119 + 76 = 360$$

$$x = 116^\circ$$

Q2 Text Solution:

Let the angles are $4x, 3x, 4x, 5x$.

$$4x + 3x + 4x + 5x = 360$$

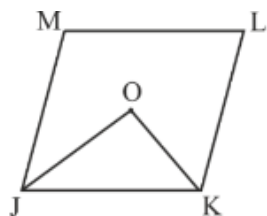
$$16x = 360$$

$$x = 22.5^\circ$$

$$5x = 5 \times 22.5$$

$$\Rightarrow 112.5^\circ$$

Q3 Text Solution:



Here OK and OJ are angle bisector so in $\triangle JOK$,

$$\angle JOK + \frac{1}{2}\angle J + \frac{1}{2}\angle K = 180^\circ$$

$$\angle JOK = 180 - \left(\frac{1}{2}\angle J + \frac{1}{2}\angle K \right)$$

$$\angle M + \angle L + \angle J + \angle K = 360$$

$$\angle J + \angle K = 360 - (\angle M + \angle L)$$

$$\angle JOK = 180 - \frac{1}{2}(360 - (\angle M + \angle L))$$

$$\angle JOK = \frac{1}{2}(\angle M + \angle L)$$

Q4 Text Solution:

In parallelogram opposite angles are equal so,

$$2x + 40 = 4x - 50$$

$$2x = 90$$

$$x = 45$$

$$\text{Angles are } 2x + 40 = 90 + 40 = 130$$

$$4x - 50 = 180 - 50 = 130$$

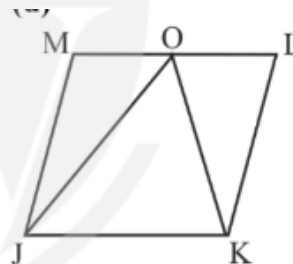
$$\text{other two angles} = 360 - 2 \times 130$$

$$= 360 - 260$$

$$= 100$$

$$\text{each angle equal to} = \frac{100}{2} = 50^\circ$$

Q5 Text Solution:



JO and OK are the \angle s bisector of $\angle J$ and $\angle K$.

$$\angle MJO = \angle OJK = 25^\circ$$

$$\angle MJK + \angle JKL = 180^\circ$$

$$\angle JKL = 180 - 50 = 130$$

$$ML \parallel JK \text{ So, } \angle MOJ = \angle OJK = 25^\circ \text{ So,}$$

$$MJ = MO (\angle MJO = \angle MOJ)$$

OK is the angle bisector of $\angle K$

$$\angle LKO = \angle OKJ = 65^\circ$$

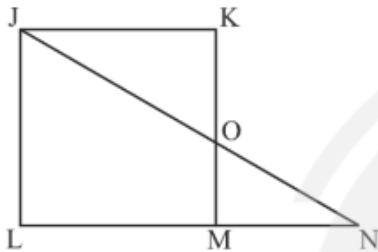


$OL \parallel JK$ So, $\angle LOK = \angle JKO = 65^\circ$
 So, $OL = LK$

Q6 Text Solution:

$\angle DAB + \angle CBA = 180^\circ$
 $\angle DAB = 180 - 76 = 104^\circ$
 $\angle CAB = 104 - 54$
 $\angle CAB = 50^\circ$
 $\angle CAB = \angle DCA$
 $= 50^\circ$ (Alt. interior angle)
 $\angle DAC = \angle ACB$
 $= 54^\circ$ (Alt. interior angle)
 Required sum $\Rightarrow 50 + 54 = 104^\circ$

Q7 Text Solution:



Here O is the midpoint of KM then In $\triangle JOK$ and $\triangle MON$

$OK = OM, \angle JKO = \angle OMN$
 $\angle JOK = \angle MON$ So,

$\triangle JOK \cong \triangle MON$
 So, $JK = MN$
 $LM + JK = LM + MN$
 $LN = 2LM$

Q8 Text Solution:

In parallelogram, diagonal bisect each other.

Q9 Text Solution:

Here, JKLM is a square and MNL is an equilateral triangle.

$JK = KL = LM = MJ$ and $NM = ML = NL$

So, $JK = KL = LM = MJ = LN = NM$

$\angle JML = 90^\circ, \angle NML = 60^\circ$
 $\angle JMN = 90^\circ + 60^\circ = 150^\circ$
 $\angle JMN = \angle NLK = 150^\circ$
 $MN = MJ$ So, $\triangle MNJ$ is an isosceles Δ .
 $LN = LK$ so $\triangle NLK$ is an isosceles Δ .
 Hence option (d) will be the correct choice.

Q10 Text Solution:

In $\triangle MPO$ and $\triangle KNO$

$\angle OPM = \angle ONK = 90^\circ$
 $\angle POM = \angle NOK$ (VOA)
 $MP = NK$
 So, $\triangle MPO \cong \triangle KNO$
 So, $OM = OK$
 $OP = ON$
 $\angle PMO = \angle NKO$

Q11 Text Solution:

In $\triangle JKN$ and $\triangle JMN$

$JK = JM$

$\angle JKN = \angle JMN$
 $JN = JN$ (Common)
 So, $\triangle JKN \cong \triangle JMN$
 $KN = NM$
 $\angle KJN = \angle MJN$
 Now in $\triangle KLN$ and $\triangle MNL$
 $KL = LM$
 $LN = LN$

$\angle LKN = \angle LMN$
 $\triangle KLN \cong \triangle MNL$
 $\angle KLN = \angle MLN$

Q12 Text Solution:

JKLM is a square So,



$$\begin{aligned}
 KL &= LM \\
 KP + PL &= LN + NM \\
 KP &= LN (\because LP = MN)
 \end{aligned}$$

Now in $\triangle OPK$ and $\triangle NPL$

$$\begin{aligned}
 OK &= PL \\
 PK &= LN
 \end{aligned}$$

$$\begin{aligned}
 \angle NLP &= \angle OKP (90^\circ \text{ each}) \\
 \triangle OPK &\cong \triangle NPL \text{ (SAS criteria)}
 \end{aligned}$$

$$OP = NP \text{ (By C.P.C.T)}$$

In $\triangle OPN$, if $OP = NP$, then
 $\angle PNO = \angle PON$

Q13 Text Solution:

Here,

Q is the midpoint of JL and $QR \parallel JK$

So, one can say that R is also a midpoint of LK .

Similarly, P is the midpoint of ML .

$$MP = PL$$

In $\triangle MKL$, P and R are the midpoint of ML and LK and $PR \parallel MK$ So,

$$\begin{aligned}
 PR &= \frac{1}{2}MK \\
 \Rightarrow PR &= \frac{1}{2} \times JL \Rightarrow \frac{1}{2} \times 12 = 6cm
 \end{aligned}$$

Q14 Text Solution:

Here base is same i.e., JK

$$JK = PL \text{ and } JK = MN$$

So one can say that $PL = MN$

$$JK + PL = JK + MN$$

As we know that the hypotenuse is a longest

side of the triangles.

$$JP > JM \text{ and } KL > KN$$

$$JP + KL > JM + KN$$

Perimeter of rectangle

$$= JK + KN + MN + JM$$

Perimeter of $\parallel gm = (JK + KL + PL + JP)$
 if we check the above two perimeters carefully
 then we can say

Perimeter of $\parallel gm >$ Perimeter of rectangle.

Q15 Text Solution:

$$JM = KL \text{ (opposite sides of } \parallel gm JJLM)$$

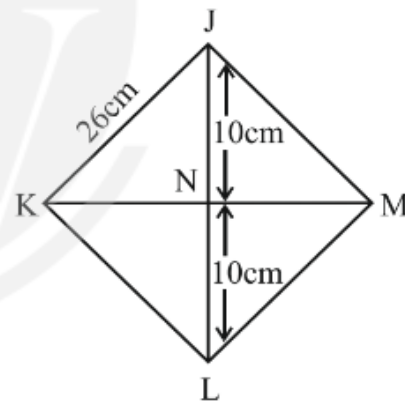
$$MN = LO \text{ (opposite side of } MNOL)$$

$$JN = KO \text{ (opposite side of } \parallel gm JKON)$$

$$\triangle JMN \cong \triangle KLO$$

$$\text{So are } \triangle KLO = 9.6cm^2$$

Q16 Text Solution:



In $\triangle JKN$

$$JK^2 = JN^2 + KN^2$$

$$(26)^2 = (10)^2 + (KN)^2$$

$$(KN)^2 = (26)^2 - (10)^2$$

$$(KN)^2 = 36 \times 16$$

$$(KN) = 24cm$$

$$KM = 2 \times 24 = 48cm$$



Q17 Text Solution:

One knows that diagonal of a rectangle are congruent and bisect each other.

$$\text{So, } OJ = OK, \text{ So } \angle OKJ = 39^\circ$$

$$\Rightarrow \angle \beta = 90 - 39 = 51^\circ$$

$$\Rightarrow \angle JOK = 180 - 2 \times 39$$

$$\Rightarrow \angle JOK = 180 - 78$$

$$\angle JOK = 102$$

$$\angle JOK = \angle MOL = 102^\circ = \alpha$$

$$\alpha + \beta = 102 + 51$$

$$\Rightarrow 153^\circ$$

Q18 Text Solution:

$$\angle LOK = 180 - 116$$

$$\Rightarrow \angle LOK = 64^\circ$$

$$OL = OK$$

$$\angle OLK + \angle OKL + \angle LOK = 180^\circ$$

$$2\angle OLK = 180 - 64$$

$$2\angle OLK = 116$$

$$\angle OLK = 58^\circ$$

$$\alpha = 58^\circ$$

$$\angle MOL = \angle JOK \quad (\text{V.O.A.})$$

$$\angle MOL = 116^\circ$$

$$\text{So, } \beta = \frac{(180 - 116)}{2} = 32^\circ$$

$$\begin{aligned} \text{Required difference} &= 58 - 32 \\ &= 26^\circ \end{aligned}$$

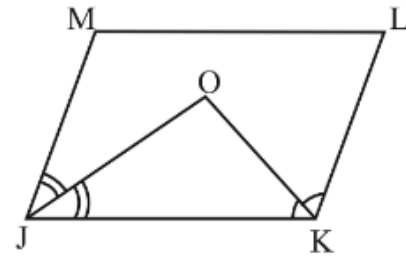
Q19 Text Solution:

One knows the diagonal of the square bisect the angles.

$$\text{So, } \angle OKN = 45^\circ$$

$$\angle NOK = \angle MOL = 76^\circ \quad (\text{V.O.A.})$$

$$\begin{aligned} \angle JNO &= 76 + 45^\circ \quad (\text{exterior angle theorem}) \\ &= 121^\circ \end{aligned}$$

Q20 Text Solution:

As we know, $\angle J + \angle K = 180$

$$\frac{1}{2}\angle J + \frac{1}{2}\angle K = \frac{1}{2} \times 180$$

$$\angle OJK + \angle OKJ = 90^\circ$$

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

$$\angle JOK = 90^\circ$$

90 will be the correct choice.

Q21 Text Solution:

One knows that opposite side and opposite angle of a $\parallel gm$ are equal.

$$\angle M = \angle K, MJ = LK, JK = ML$$

$$NJ = \frac{1}{3} \times MJ, LQ = \frac{1}{3} \times LK$$

$$\text{So } NJ = LQ$$

In $\triangle MNL$ and $\triangle JKQ$ we have,

$$JK = ML, \angle M = \angle K, MN = KQ$$

$$\triangle MNL \cong \triangle JKQ$$

$$\text{So } NL = JQ$$

So, NJQL is a $\parallel gm$

Q22 Text Solution:

In $\triangle MON$ and $\triangle POK$

$$OM = OK$$

$$\angle MON = \angle POK \quad (\text{V.O.A.})$$

$$\angle NMO = \angle OKP \quad (\text{Alt. int. } \angle S)$$



So $\triangle MON \equiv \triangle POK$ (AAS)

So $ON = OP$ (C.P.C.T)

Q23 Text Solution:

As JKLM is a $\parallel gm$

So $JK = LM$ and $JM = LK$

$JK = JO + OK$ and $ML = MN + NL$

This means that

$$JO = OK = MN = NL$$

So, $JO = MN$ then $JONM$ is a $\parallel gm$,

$OK = NL$ then $OKLN$ is a $\parallel gm$

Hence $JM \parallel ON \parallel KL$

These three lines are cutted down by a transversal QR, ML and JK.

When ML is a transversal then, $MN = NL$

When JK is a transversal then $JO = OK$

Similarly, with the intercept theorem, $QP = PR$

Q24 Text Solution:

Since, JKLM is a $\parallel gm$ that $JK = ML$ and $MJ \parallel LK$ PNOJ is a $\parallel gm$ and $PN \parallel JO$

So, $PQ \parallel JK$ then $\angle L = \angle NQK = 60^\circ$

Here $MJ \parallel LK$, $PJ \parallel NO$, then $NO \parallel LK$

then $\angle NQK = \angle PNO = 60^\circ$

Q25 Text Solution:

Here $\angle NLM = 139^\circ$

$$\angle MLO = 180 - 139 \Rightarrow 41^\circ$$

$OL = OM$ So

$$\angle MOL = 180 - 2 \times 41$$

$$\angle MOL = 180 - 82$$

$$\angle MOL = 98^\circ$$

$$\angle MOL = \angle JOK = \text{V.O.A.} = 98^\circ$$

Q26 Text Solution:

Here JKLM is a rhombus

So, one can say that the diagonal intersects at 90°

$$\angle MOL = \angle MOJ = \angle JOK = \angle KOL = 90^\circ$$

$$\angle MLO = 180 - 160 = 20^\circ$$

$$\beta = 90^\circ$$

$$\text{as } ML = MJ \text{ then } \angle MLO = \angle MJO = 20^\circ$$

$$\gamma = 20$$

In $\triangle MOL$

$$\angle LMO = 180 - 90 - 20$$

$$\angle LMO = 70^\circ$$

$$\angle \alpha = \angle LMO$$

$$= 70^\circ \text{ (Alternate interior angle)}$$

$$\angle \alpha + \angle \beta + \angle \gamma = 90 + 20 + 70$$

$$= 180$$

Q27 Text Solution:

Here, P, Q, N, O are the midpoints.

In $\triangle JKL$, $NO \parallel JL$ so by using mid point theorem $NO = \frac{1}{2} \times JL$

In $\triangle MJL$, Q and P are the midpoint so $QP \parallel JL$ and $PQ = \frac{1}{2} \times JL$

By (1) and (2) we get,

$$NO = PQ \text{ and } NO \parallel PQ$$

So NOPQ is a $\parallel gm$ and diagonal of parallelogram bisect each other, So PN and OQ bisect each other.

Q28 Text Solution:

Perimeter = 32 cm

$$2(10 + x) = 32 \text{ (x is shorter side)}$$

$$\Rightarrow 20 + 2x = 32$$

$$\Rightarrow 2x = 12$$

$$\Rightarrow x = 6$$

Shorter side is '6 cm'.

Q29 Text Solution:

JKLM is a $\parallel gm$

So, $JK \parallel ML$, $JK = ML$ then $PK \parallel MQ$

So, $PK = MQ \Rightarrow \frac{1}{2} JK = \frac{1}{2} ML$ So PKQM is a $\parallel gm$.



Q30 Text Solution:

Here JKLM is a rhombus,

$PJKQ$ is a straight line, $PJ = JK = KQ$

$$OJ = OL,$$

And $OK = OM$ (diagonal)

In $\triangle PMK$, O and J are the midpoint of MK and PK respectively.

$OJ \parallel PM$

So $OL \parallel MR$

In $\triangle JLQ$, O and K are the midpoint of JL and JQ . $OK \parallel LQ$ so $OM \parallel RL$ Thus $MOLR$ is a $\parallel gm$ So

$$\angle MRL = \angle MOL = 90^\circ$$

$\angle MRL = \angle PRQ = 90^\circ$ 90 is the correct answer.



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