Quadrilateral Formative assessment

Question 1
Which are these is true or false about parallelogram

(a) The diagonals of a parallelogram bisect each other
(b) In a parallelogram, opposite sides and angle are equal.
(c) A diagonal of a parallelogram divides it into two congruent triangles
(d) The bisectors of the angles of parallelogram create a rectangle
(e) Sum of all the internal angles is 360^0
(f) Sum of all the exterior angles is 180^0
(g) Square, rectangle and rhombus are all parallelogram
(h) Consecutive angles are supplementary

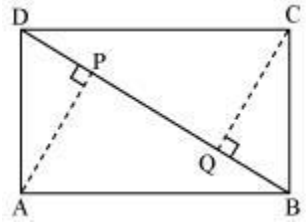
Solution
(a) True. It is by definition
(b) True. It is by definition
(c) True. This can be proved easily using SSS congruence
(d) True
(e) True. This can easily proved by drawing one diagonal and summing all the angles based on triangle angle sum
(f) False
(g) True
(h) True

Question 2
True or False statement
(a) All the angles of the quadrilateral are obtuse
(b) Diagonal of the rhombus are equal and perpendicular to each other
(c) Diagonal of the square are equal and bisect each other at right angle
(d) Out of four points A,B,C,D in place, there are collinear. A quadrilateral can be formed from these points
(e) Trapezium, in which the sides that are not parallel are equal in length and angles formed by parallel sides are equal, such trapezium is called isosceles trapezium
(f) In a parallelogram, diagonal bisect the angles

Solution
(a) False
(b) false
(c) True
(d) False
(e) True
(f) True

Multiple choice Questions

Question 3
ABCD is a parallelogram and AP and CQ are perpendiculars from vertices A and C on diagonal BD



Which of the following is true based on given information
a) AP=CQ
b) QD=PB
c) DP=QB
d) $\Delta PAD \cong \Delta QCB$

Solution
All are correct

In Triangle ΔPAD and ΔQCB

AD=CB
Angle P= Angle Q=90^0
$\angle CBQ = \angle ADP$ Alternate interior angles of AB||CD
So AAS congruence
$\Delta PAD \cong \Delta QCB$
Also as they are congruent, we get AP=CQ and DP=QB

Now Lets see the triangles ΔAPB and ΔCQD
AB=CD
Angle P= Angle Q=90^0
$\angle ABP = \angle CDQ$ Alternate interior angles of AB||CD
So QD=PB

Question 4
The angles of the quadrilateral are in the ratio 2:5:4:1?

Which of the following is true?
a) Largest angle in the quadrilateral is 150^0
b) Smallest angle is 30^0
c) The second largest angle in the quadrilateral is 80^0
d) None of these

Solution (a) and (b)
Angles are 2x, 5x,4x,x

Now

2x+5x+4x+x=360

Or x=30

Angles are 30, 60,120,150

Question 5
Two adjacent angles in a parallelogram are in the ration 2:4. Find the values?
a) 80,100
b) 40,140
c) 60,120
d) None of the above

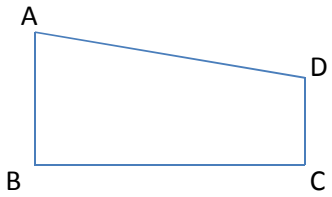
Solution (c)

Adjacent angles
2x+4x=180
x=30

60,120 are adjacent angles

Question 6
ABCD is a trapezium with AB =10cm, AD=5 cm, BC=4 cm and DC =7 cm?
Find the area of the ABCD

a) 34 cm^2
b) 28cm^2
c) 20 cm^2
d) None of these



Solution (a)

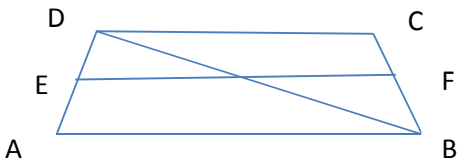
BC is the altitude between the two parallel sides AB and DC
So Area of trapezium will be given by
$A = \frac{1}{2}BC(AB + DC) = 34\text{cm}^2$

Question 7
PQRS is a quadrilateral whose diagonal bisect each other at right angles

a) PQRS is a Square
b) PQRS is a rectangle
c) PQRS is a rhombus
d) None of these

Solution (c)

Question 8
ABCD is a trapezium where AB||DC. BD is the diagonal and E is the mid point of AD. A line is draw from point E parallel to AB intersecting BC at F. Which of these is true?



a) BF=FC
b) EA=FB
c) CF=DE
d) None of these

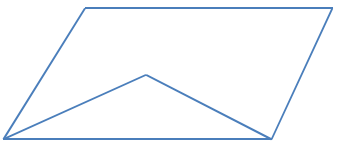
Solution (a)
Let's call the point of intersection at diagonal as G
Then in triangle DAB
EG||AB and E is the mid point of DA,So by converse of mid point theorem,
G is the mid point of BD

Now in triangle DBC
GF||CD
G is the mid point of DB
So by converse of mid point theorem
F is the mid point of BC

Question 9
ABCD is a rectangle and P, Q, R and S are mid-points of the sides AB, BC, CD and DA respectively
a) PQRS is a rectangle
b) PQRS is a parallelogram
c) PQRS is a rhombus
d) None of these

Solution (c)

Question 10
In a parallelogram PQRS, The bisector of angles P and Q meet at point O as shown in below figure. What is the angle O?



a) 80
b) 90
c) 45
d) None of the above

Solution (b)

Match the column

Rhombus	Is a quadrilateral with only one pair of parallel sides.
Rectangles	Is a quadrilateral whose Two pairs of adjacent sides of a kite are equal, and one pair of opposite angles is equal. Diagonals intersect at right angles. One diagonal is bisected by the other.
Kite	Is a quadrilateral whose all the sides are equal and opposite sides are parallel. Opposite angles are equal.
Right-angled trapezoid	Is a quadrilateral whose opposite sides of a rectangle are parallel and equal. All angles are 90º.
Isosceles trapezoid	A trapezoid having two right angles
Trapezoid	Is a trapezoid whose non parallel sides are equal