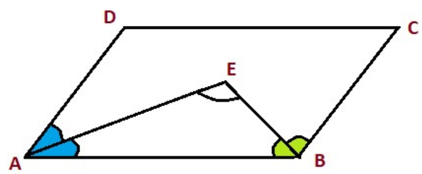
5th May, 2020

SATISH CHANDRA MEMORIAL SCHOOL

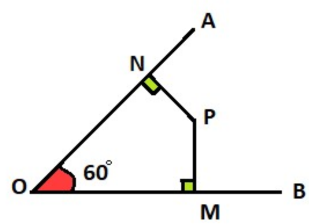
Class: VIII Ch: 3 (Understanding Quadrilaterals)

Worksheet-5(Special)

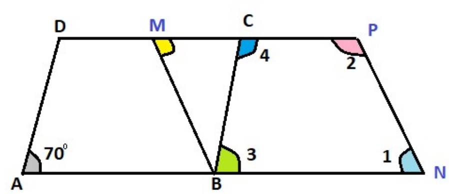
1. Is it possible to have a regular polygon each of whose interior angle measures 145°?
2. Prove that sum of all interior angles of a concave quadrilateral is 360°.
3. In the given figure, ABCD is a parallelogram. AE and BE are bisectors of $\angle A$ & $\angle B$ respectively. Show that $\angle AEB = 90°$



4. In the given figure below, P is a point interior of $\angle AOB$. $PM \perp OB$ & $PN \perp OA$. If $\angle NOM = 60°$, find the measure of $\angle NPM$



5. In the given figure below, ABCD & BMPN are parallelograms. If BM = BC and $\angle A = 70°$, find $\angle 1, \angle 2, \angle 3$ *and* $\angle 4$.



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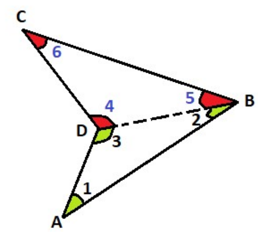
Hint:

1. Not possible.
   Each exterior angle = $180° - 145° = 35°$. Now $n = \frac{360}{35} = \frac{72}{7}$, which is not a whole no.



2. Given: ABCD is a concave quadrilateral.
   To Prove: $\angle A + + \angle B + \angle C + \angle D = 360°$
   Construction: Join B, D
   Proof:
   In $\Delta ABC, \angle 1 + \angle 2 + \angle 3 = 180° - - - - (i)$[by angle sum property of Δ]
   In $\Delta CBD, \angle 4 + \angle 5 + \angle 6 = 180° - - - - (ii)$ [by angle sum property of Δ]

   Now add(i) (ii) we get,
   $\angle 1 + \angle 2 + \angle 3 + \angle 4 + \angle 5 + \angle 6 = 180° + 180°$
   $\angle 1 + (\angle 2 + \angle 5) + \angle 6 + (\angle 3 + \angle 4) = 360°$
   $\angle A + + \angle B + \angle C + \angle D = 360°$
   Hence the prove.

3. In parallelogram ABCD, $\angle A + \angle B = 180°$ [since adjacent angles of a parallelogram are supplementary]
   $$\text{or,} \quad \frac{1}{2}\angle A + \frac{1}{2}\angle B = 90° - - - - - (i)$$
   Since AE and BE are bisectors of $\angle A$ & $\angle B$ respectively
   Therefore $\angle EAB = \frac{1}{2}\angle A$ and $\angle EBA = \frac{1}{2}\angle B$
   Now $\Delta AEB,, \angle EAB + \angle AEB + \angle EBA = 180°$ [by angle sum property of Δ]
   $$\text{or,} \quad \frac{1}{2}\angle A + \angle AEB + \frac{1}{2}\angle B = 180°$$
   $$\text{or,} \quad (\frac{1}{2}\angle A + \frac{1}{2}\angle B) + \angle AEB = 180°$$
   $$\text{or,} \quad 90° + \angle AEB = 180° \ [by\ using\ equation\ (i)]$$
   $$\text{Therefore } \angle AEB = 90°$$

4. $\angle NPM = 120°$ [apply the angle sum property of a quadrilateral]
5. $\angle 1 = 70°, \angle 2 = 110°, \angle 3 = 70°, \angle 4 = 110°,$