1. In fig. 1, ABCD is a straight line; BQ, CQ are the bisectors of $\angle PBD$, $\angle PCD$. Which is the longer,
(a) PB or PC,
(b) BC or QC?

![Diagram of a straight line with bisectors BQ and CQ](image)

(a) $\angle PBC = 180^\circ - 118^\circ = 62^\circ$ adj. $\angle$s. on a st. line
$\angle PCB = 118^\circ - 80^\circ = 38^\circ$
$\angle PBC > \angle PCB$
$PC > PB$ greater side opp. greater $\angle$

(b) $\angle QBC = 62^\circ \div 2 = 31^\circ$ given
$\angle PCD = 180^\circ - 38^\circ = 142^\circ$ adj. $\angle$s. on a st. line
$\angle QCD = 142^\circ \div 2 = 71^\circ$ given
$\angle BQC = 71^\circ - 31^\circ = 40^\circ$ ext. $\angle$ of $\triangle QBC$
$\angle BQC > \angle QBC$
$BC > QC$ greater side opp. greater $\angle$

2. ABCD is a trapezium in which AB, DC are the parallel sides; AC cuts BD at K. If $\angle CAB = 38^\circ$ and $\angle AKB = 100^\circ$, find which is the greater, AC or BD.

![Diagram of a trapezium with K as the intersection point](image)
∠KAB = 38°
∠KBA = 180° - 100° - 38° = 42°
∠KBA > ∠KAB
KA > KB
∠KDC = 40°
∠KCD = 38°
∠KDC > ∠KCD
KC > KD
AC = KA + KC
BD = KB + KD
AC > BD

3. In △ABC, ∠B = 90°, ∠C = 31°; prove that AB > 1/2 AC.

Construction: Mark the mid-point of AC as M. Produce BM to D such that BM=MD.
ABCD is a parallelogram
∠ABC = 90°
ABCD is a rectangle
AC=BD
AM=BM=MC
∠MBC = 31°
∠BMA = 31° + 31° = 62°
∠MAB = 180° − 90° − 31° = 59°
∠BMA > ∠MAB
AB > MB = 1/2 AC