

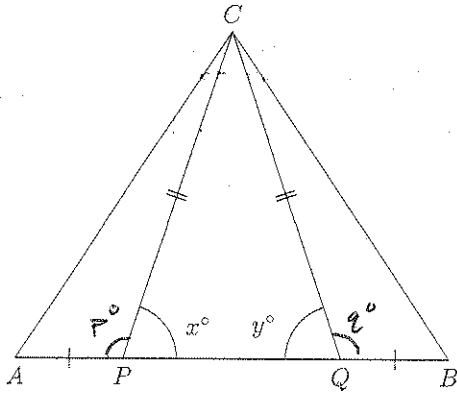
# MTH 202 - Quiz 5

17 October 2015

Name: Solutions

No calculators or other electronic devices are allowed on this quiz. If you need more space to solve a problem, use the back of the paper. In order to receive full credit, show all your work on the problems.

1. (9 points) In the following figure,  $AP = BQ$ ,  $CP = CQ$ , and  $x = y$ . Write a careful proof that  $AC = BC$ .



Construction: Mark  $P, Q$

Proof:  $P = 180 - x$  angles on line  
 $Q = 180 - y$  — " —

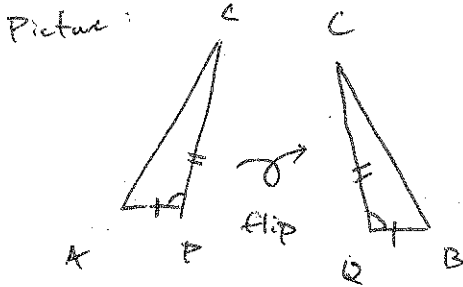
$\therefore P = Q$   $x = y$ , given

$AP = BQ$  given

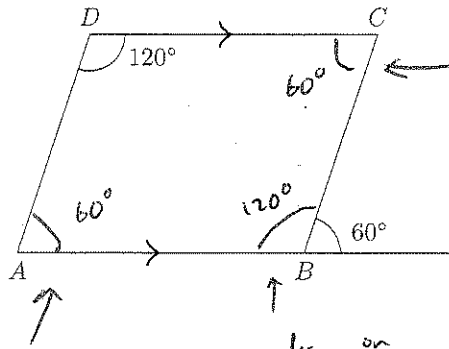
$PC = QC$  given

$\therefore \triangle APC \cong \triangle BQC$  SAS

$AC = BC$  corresp. sides under congruence.



2. (8 points) Show that  $ABCD$  is a parallelogram; you may use any facts stated in class. You do not need to write a full proof, but do justify all your steps.



alt. int. angles  
in transversal

angles on  
a line.

Both pairs of opposite  
angles are equal. We

showed in class why

this means  $ABCD$

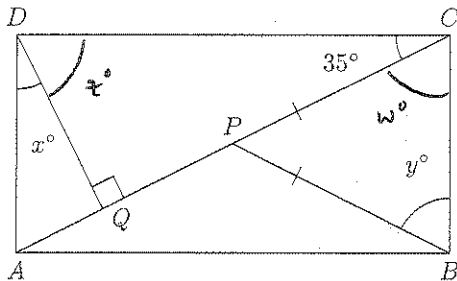
is parallelogram. ✓

Sum of int.  $\angle$ s

$$= 180^\circ \cdot (4 - 2) = 360^\circ$$

Already have  $120^\circ + 60^\circ + 120^\circ$   
 $\angle D \quad \angle C \quad \angle B$   
 $= 300^\circ$

3. (8 points) In the following figure,  $ABCD$  is a rectangle. Find  $x$  and  $y$ .



Rectangle  $\Rightarrow \angle A = \angle B = \angle C = \angle D = 90^\circ$

$$z + 90 + 35 = 180$$

sum of  
angles in  
 $\triangle DQC$

$$\therefore z = 55$$

$$x + z = 90$$

$$\boxed{x = 35}$$

Note  $\triangle PCB$  is isosceles.

$$\therefore y = w$$

Also  $w + 35 = 90$

$$\boxed{y = 55}$$