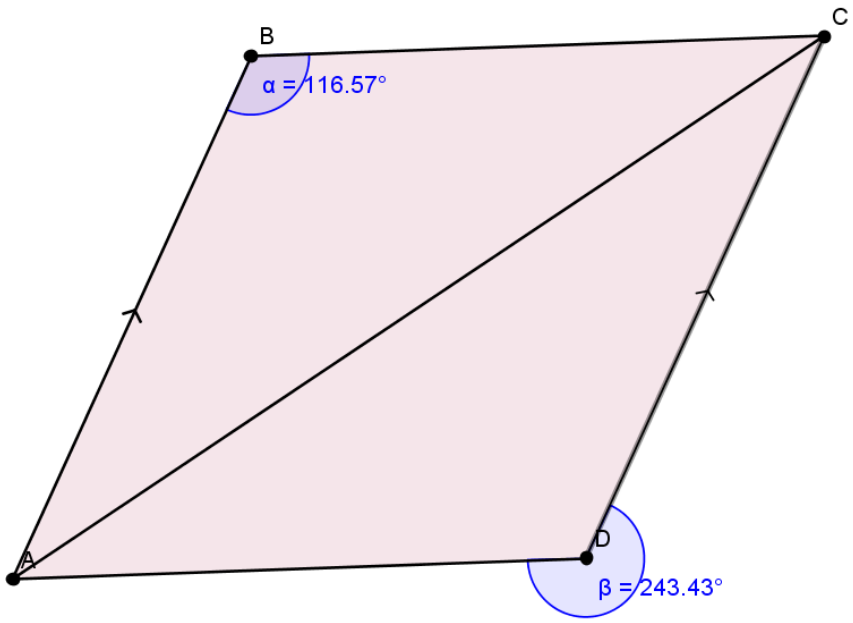
Worksheet 11 – Euclidian geometry

Grade 10 Mathematics

1. State whether the following statements are true or false and if they are false give a reason for your answer.

   a) All parallelograms are trapeziums.
   b) All squares are rectangles.
   c) All trapeziums are parallelograms.
   d) All rectangles are squares,
   e) All squares are rhombuses.
   f) All squares are kites.
   g) All rhombuses are squares.
   h) All rhombuses are trapeziums.
   i) All parallelograms are rectangles.
   j) All rectangles are parallelograms.

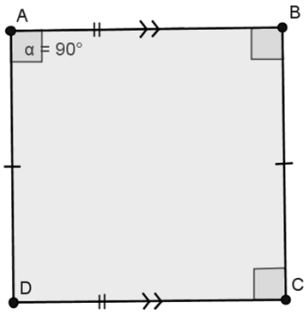
2. Use the diagram below to answer the questions that follow:



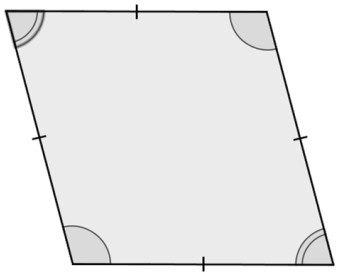
   a) Calculate the internal angle $A\hat{D}C$.
   b) Prove that $\Delta ABC \equiv \Delta ACD$, remember to give reasons where applicable.
   c) What kind of quadrilateral is $ABCD$, give reasons where applicable.

3. Define each shape below and give reasons for your answer.

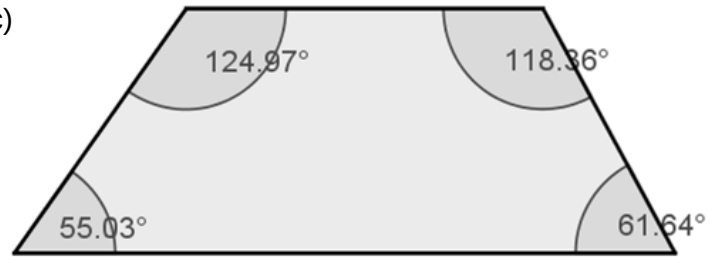
a)



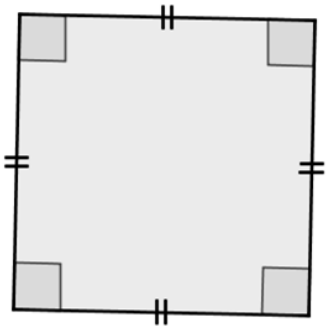
b)



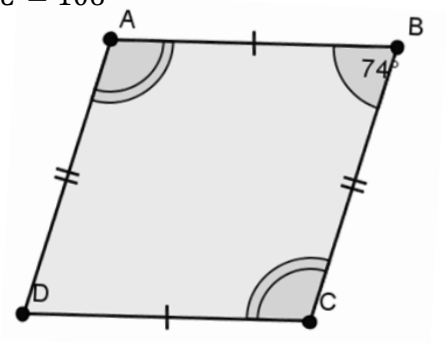
c)



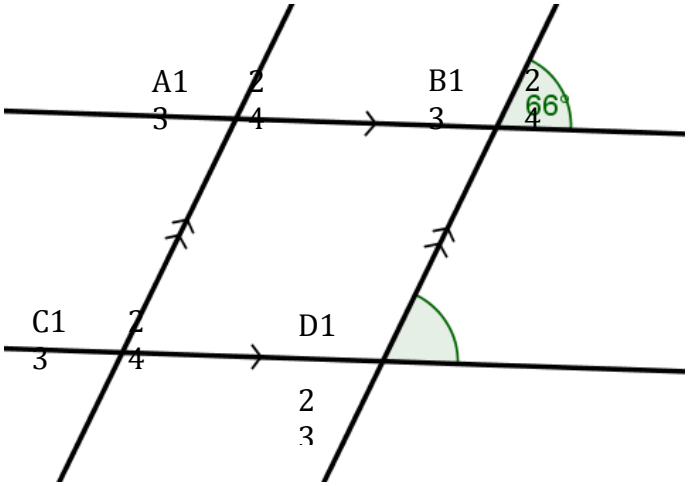
d)



e) $\hat{C} = 106°$



4. Use the diagram below to answer the following questions. Give reasons where necessary.

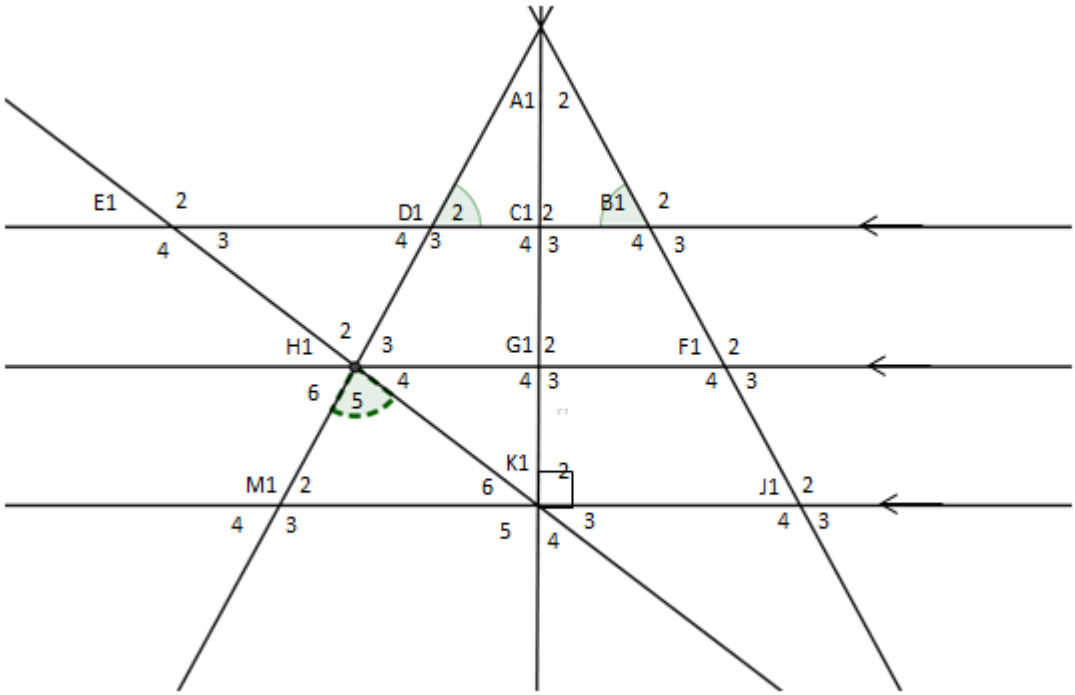


a) Calculate $\hat{C}2$.

b) Calculate $\hat{C}1$.

c) Calculate $\hat{A}4$.

5. Use the given diagram to answer the following questions. Indicate reasons where necessary. $\hat{D}2 = 61°$ and $\hat{D}2 = \hat{B}1$ and $\hat{E}2 = 106°$.



a) Calculate $\hat{H}3$.

b) Calculate $\hat{D}3$.

c) Calculate $\hat{D}4$.

d) Calculate $\hat{E}3$.

e) Calculate $\hat{H}2$.

f) Calculate $\hat{M}1$.

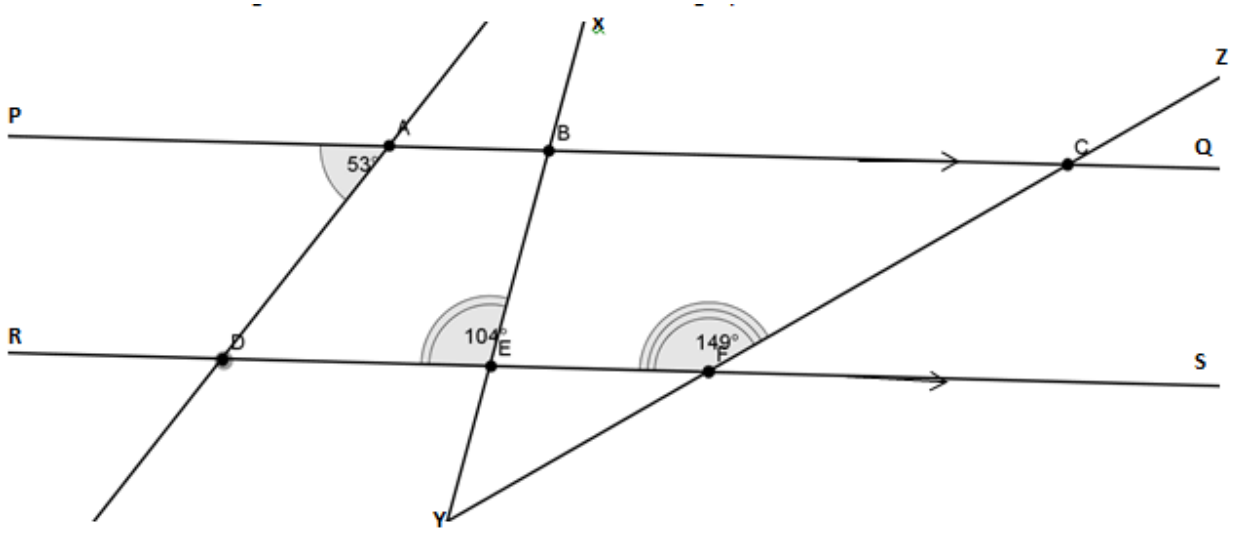
g) Calculate $\hat{M}2$.

h) Calculate $\hat{H}6$.

i) Calculate $\hat{H}5$.

j) Calculate $\hat{K}1$.

6. Use the diagram below to answer the following questions:



a) Calculate $A\hat{D}E$.

b) Calculate $A\hat{B}E$.

c) Calculate $C\hat{B}X$.

d) Calculate $E\hat{F}Y$.

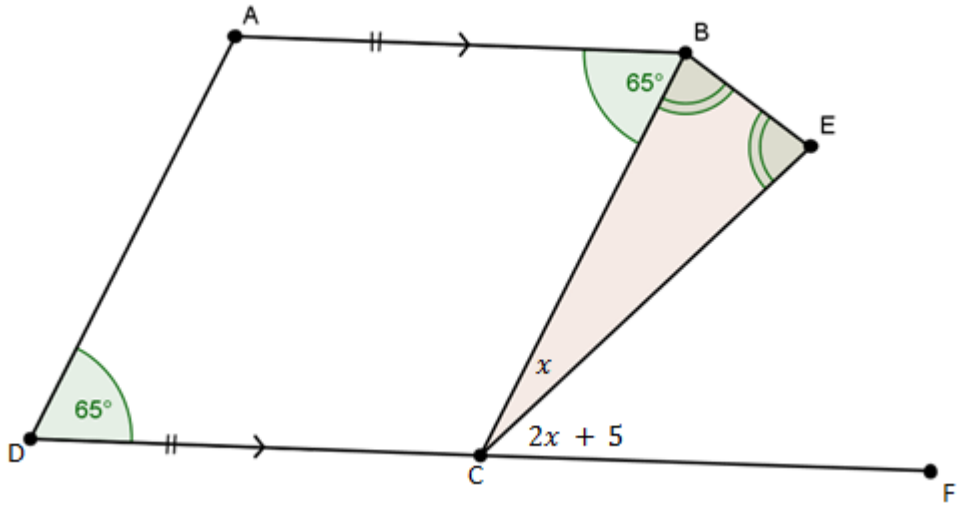
e) Calculate $B\hat{C}F$.

f) Calculate $C\hat{B}E$.

g) Why is $B\hat{C}F + C\hat{B}E \neq 180°$

7. Use the diagram below to answer the following questions:

$B\hat{A}F = x°\ and\ E\hat{A}F = 2x + 5,\ AF = 3{,}1\ cm$ Give reasons where necessary.



a) Calculate the size of $B\hat{A}D$.

b) Calculate the value of x. $(B\hat{A}F)$

c) Calculate the value of $\hat{F}$.

d) What type of triangle is ΔABF?

e) What kind of quadrilateral is $ABCD$?

8. If quadrilateral PQRS is a square give the following, include reasons where necessary.

a) Angle a.
b) Angle b.
c) Length of line c.
d) Angle d.

9. Use the information that is given to determine if $\Delta ABC \equiv \Delta BDE$.

$C\hat{B}D = 92°$

$x = 2y$

$y = z + 2$

$z = 3$

$p = \frac{2yz}{3}$