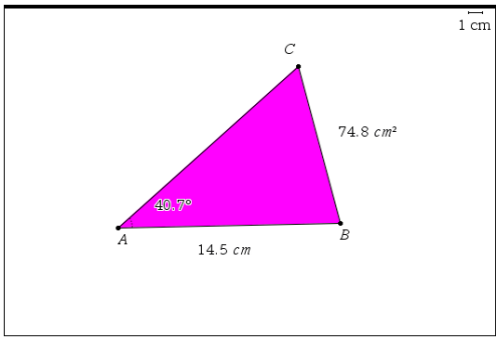
General constructions

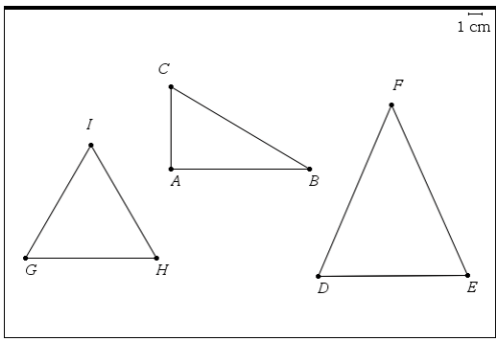
1. Construct a triangle *ABC*.

a) Label the corner points ;
b) Colour the surface ;
c) Measure the length of the line segment *AB* ;
d) Measure the area of triangle *ABC* ;
e) Measure the size of angle *A*.



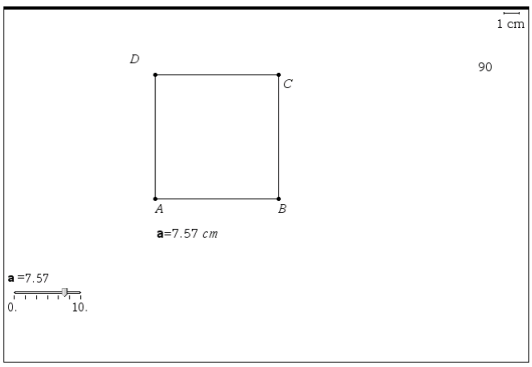
2. Construct 3 triangles

a) *ABC* which is right-angled ;
b) *DEF* which is isosceles ;
c) *GHI* which is equilateral.



3. Construct a square *ABCD* with sides of 5 cm.

a) Calculate the surface with the TI ;
b) Change the length of the sides into 10 cm ;
c) Measure the length of the line segment *AB* and name it variable a ;
d) Use the slider to change the measurements of the square.



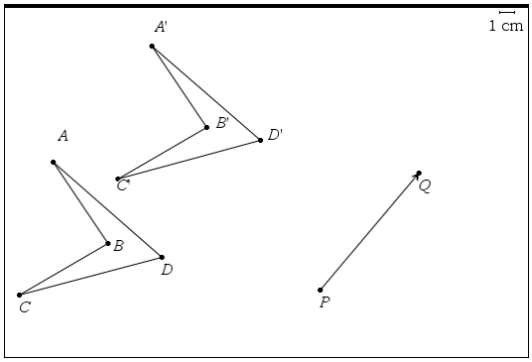
Transformations

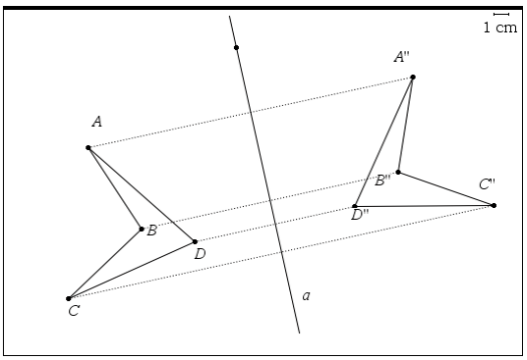
1. Draw a random quadrangle *ABCD* and a vector $\overrightarrow{PQ}$.

a) Move the quadrangle according to the vector $\overrightarrow{PQ}$;

Delete vector $\overrightarrow{PQ}$ and draw a line *a*.

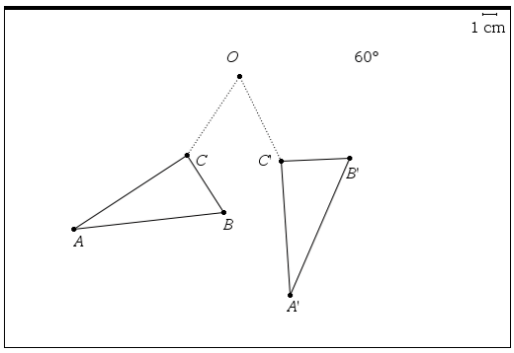
b) Reflect the quadrangle relative to the line *a* ;
c) Connect original and image with each other through a dotted line.





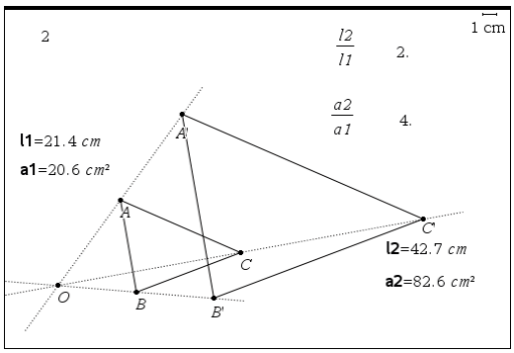
2. Draw a triangle *ABC* and a point of rotation *O*.

a) Insert the angle of rotation '60°' as text ;
b) Rotate triangle *ABC* about an angle of 60°.



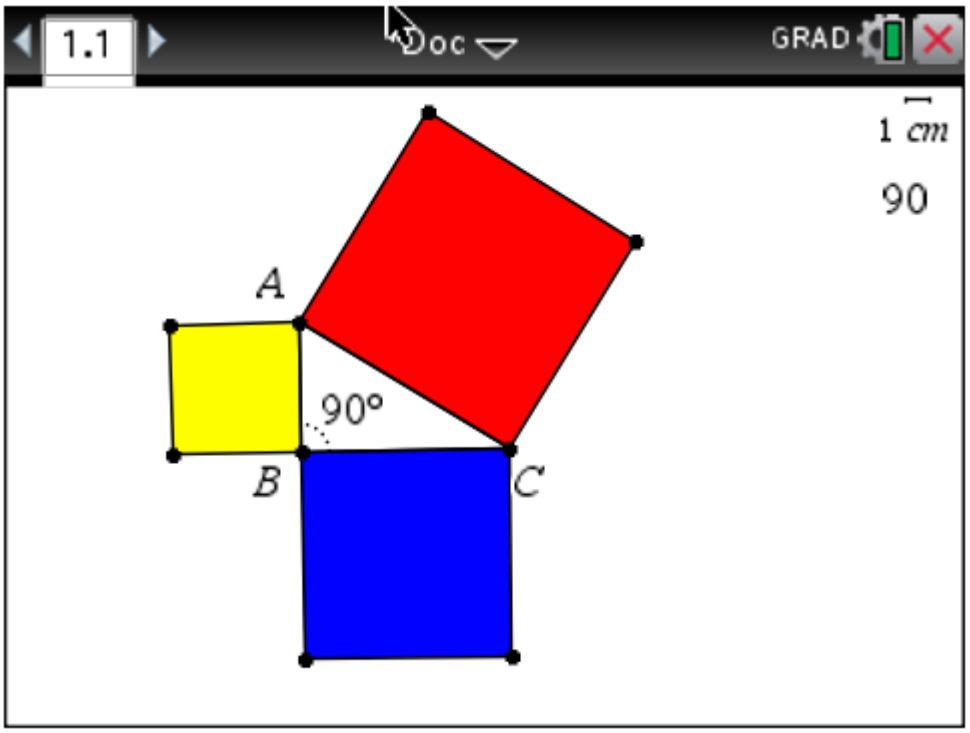
3. Draw a triangle *ABC* and the centre of the dilatation *O*.

a) Insert scale factor '2' as text ;
b) Carry out the magnification ;
c) Compare the circumference and the surface of both triangles ;
d) Name the variable factor *k*, and use the slider to draw a conclusion about the proportions of the circumference and the surface.



Pythagoras Theorem

1. Draw a right-angled triangle *ABC* with $\left|\hat{B}\right| = 90^\circ$ and construct a square on each side of the triangle.



2. Measure the area of each square and name the result on side $[AB]$ → **a1** , $[BC]$ → **a2** and $[AC]$ → **a3**.

3. Open the application NOTES and check Pythagoras Theorem.

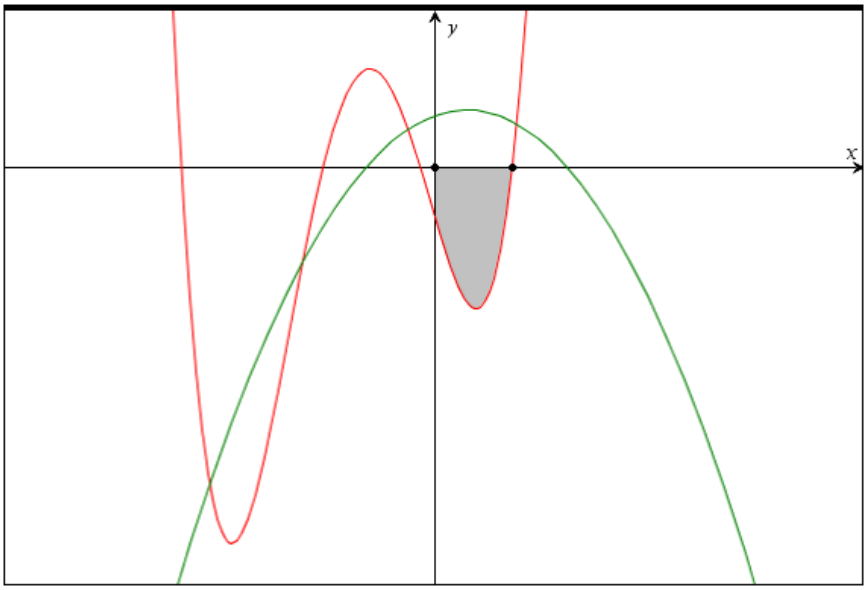
Analyze a graph with the TI-Nspire CAS

Given the function $f(x) = x^4 + 7x^3 + 2x^2 - 28x - 9$

a) Draw the graph of f and make sure that you have a suitable window ;
b) Find the coordinates of the points of intersection with the axes ;
c) Find the coordinates of the extremes of f ;
d) Calculate the area in the fourth quadrant enclosed by the function of f and the two axes ;
e) Give the equation of the tangent to f at the point where $x = -5$.

Given the function $g(x) = -2x^2 + 3x + 10$

f) Find the coordinates of the points of intersection between f and g .
Do this once - graphically
- by solving the equation (add calculator)



An enlargement combined with a function

Given the function $f : y = \dfrac{x^2 + 4x + 3}{(x-1)^2}$

a) Draw the graph of f and make sure that you have a suitable window ;

b) Define Q and R as the points of intersection with the *x*-axis and S as the point of intersection with the *y*-axis ;

c) Define P as the point of intersection of the normals to the curve at Q and R ;

d) Draw the polygon $PQRS$ and calculate the area.

Apply an enlargement with center Q and scale factor **k** to the polygon.

e) Find **k** so that S' is a point on the curve in the first quadrant and calculate the area of the enlarged polygon.