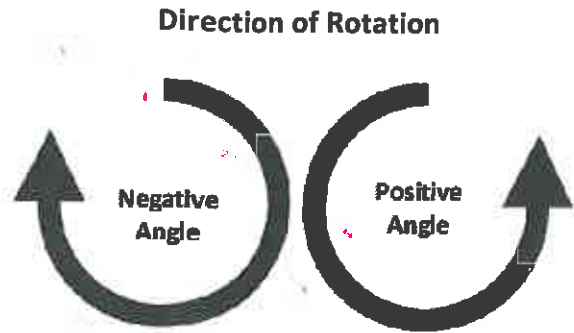
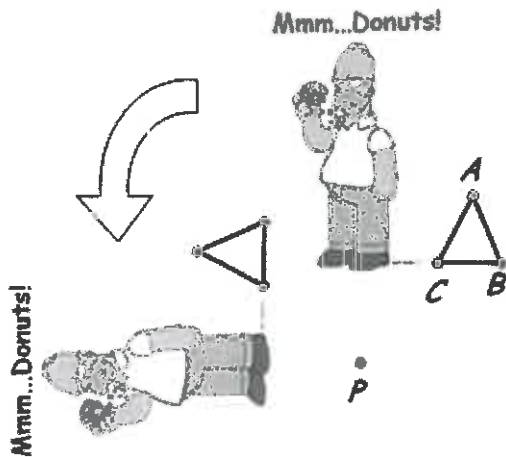


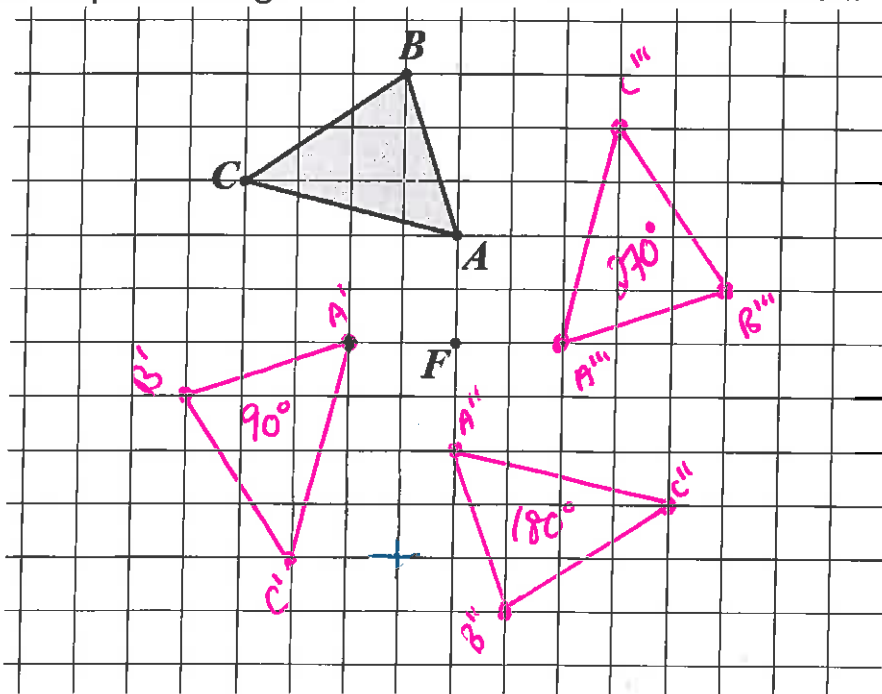
Rotations & Rotational Symmetry

Rotation – moving a 2D figure such that each point is rotated around a central point through a given angle.



Counter clock-wise for positive angles of rotation.

1a. Graph the image of $\triangle ABC$ under each transformation:



$R_{F,90^\circ}$ $\leftarrow \frac{1}{4}$ turn

$R_{F,180^\circ}$ $\leftarrow \frac{1}{2}$ turn

$R_{F,270^\circ}$ $\leftarrow \frac{3}{4}$ turn.

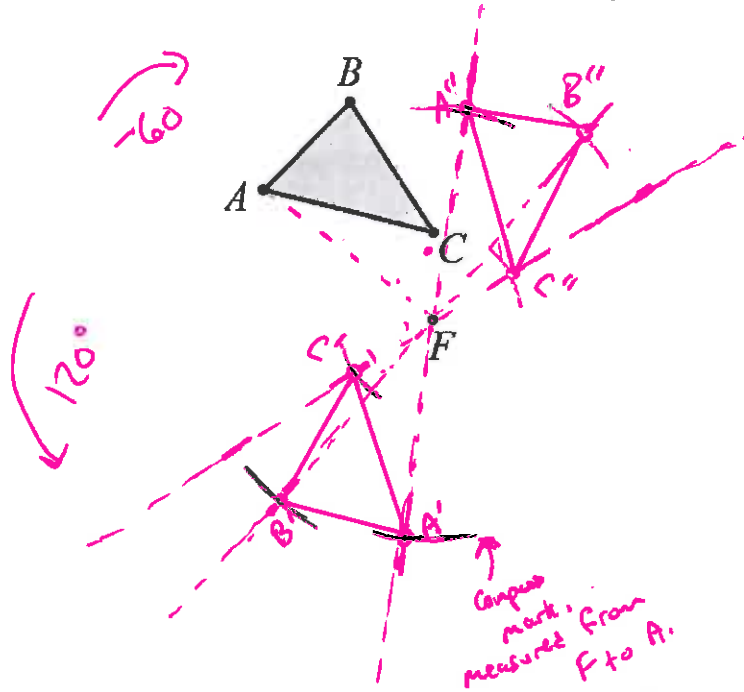
1b. Is rotation a Rigid Motion? Justify your response by providing evidence to support your claim.

yes. $AB = \sqrt{9+1} = \sqrt{10}$ and $A'B' = \sqrt{9+1} = \sqrt{10}$ so, $AB = A'B'$

Segment length was preserved.

Angle measure is also preserved since $m\angle B = m\angle B'$.

2a. Graph the image of $\triangle ABC$ under each transformation:
 (a protractor and/or compass may be useful)



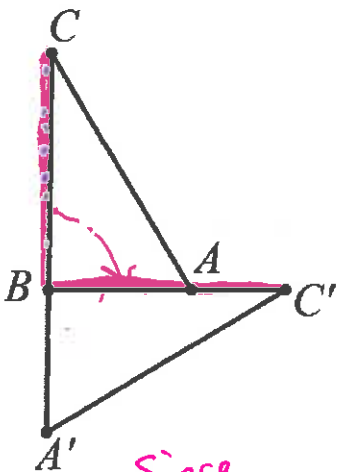
$R_{F, 120^\circ}$
 ↖ counter clockwise

$R_{F, -60^\circ}$
 ↖ clockwise

2b. Is orientation preserved under rotation? Explain your reasoning.

Orientation is preserved. $\triangle ABC$ becomes $\triangle A'B'C'$ under $R_{F, 120^\circ}$. the order of the letters did not change. under the rotation.

3.

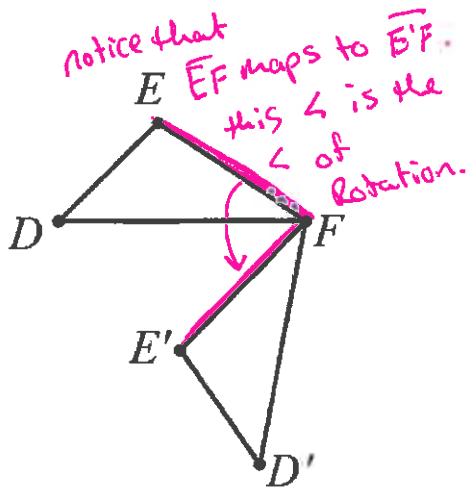


a. Precisely describe the rotation that would map $\triangle ABC$ onto $\triangle A'B'C'$.

Rotate $\triangle ABC$ clockwise an angle equal to $m\angle CBA$ around center B .

$R_{B, m\angle CBA}$

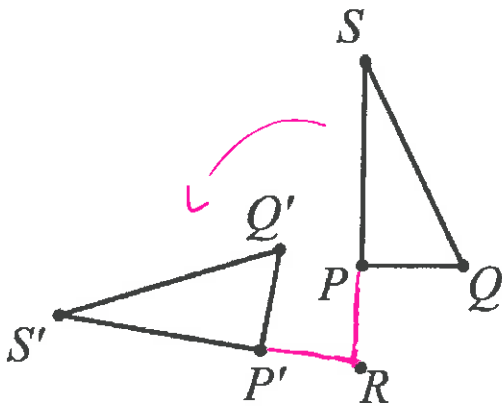
Since \overline{CB} maps to $\overline{C'B}$ the \angle formed is the \angle of rotation.



b. Precisely describe the rigid motion that would map $\triangle DEF$ onto $\triangle D'E'F'$.

Rotate $\triangle DEF$ counter clockwise around point F a measure of $\angle EFE'$

$$R_F, m\angle EFE'$$



c. Precisely describe the rigid motion that would map $\triangle PSQ$ onto $\triangle P'S'Q'$.

Rotate counter clockwise around P by $m\angle RPQ'$

$$R_P, m\angle RPQ'$$

Point Symmetry: Having a center of rotation such that a shape can be rotated 180° onto itself.

Which of the following words has point symmetry? (turn paper upside down to see it).

MOM
no.

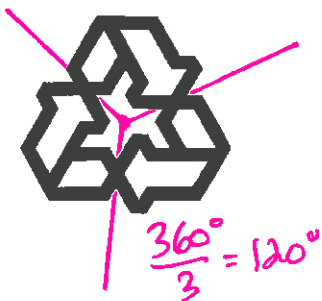
MOW
yes

chump
yes

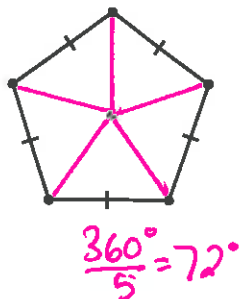
Symmetry
yes.

Rotational Symmetry: Having a center of rotation such that a shape can be rotated onto itself.

Which of the following pictures has rotational symmetry? For those that do, what is the angle of rotation?



Rotational Sym. of 120° .



Rotational Sym. of 72° .



no rotational sym.