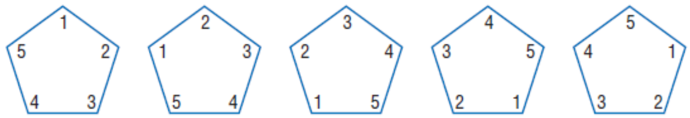
Notes 10.6 Rotational Symmetry

ROTATIONAL SYMMETRY Some objects have rotational symmetry. If a figure can be rotated less than 360 degrees about a point so that the image and the preimage are indistinguishable, then the figure has **rotational symmetry**.

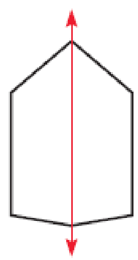


A figure in the plane has a **line of symmetry** if the figure can be mapped onto itself by a reflection in the line.

EXAMPLE 4 *Finding Lines of Symmetry*

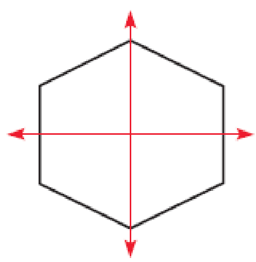
Hexagons can have different lines of symmetry depending on their shape.

a.



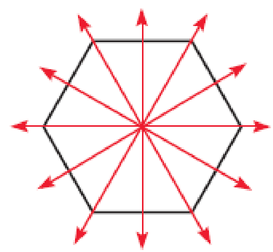
This hexagon has only one line of symmetry.

b.



This hexagon has two lines of symmetry.

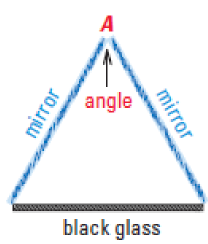
c.



This hexagon has six lines of symmetry.

EXAMPLE 5 *Identifying Reflections*

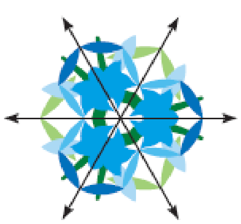
KALEIDOSCOPES Inside a kaleidoscope, two mirrors are placed next to each other to form a V, as shown at the right. The angle between the mirrors determines the number of lines of symmetry in the image. The formula below can be used to calculate the angle between the mirrors, A, or the number of lines of symmetry in the image, n.



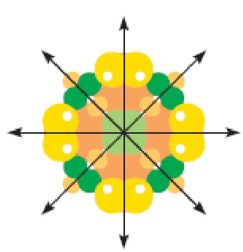
$n(m\angle A) = 180°$

Use the formula to find the angle that the mirrors must be placed for the image of a kaleidoscope to resemble the design.

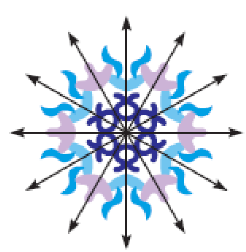
a.



b.



c.



SOLUTION

a. There are 3 lines of symmetry. So, you can write $3(m\angle A) = 180°$. The solution is $m\angle A = 60°$.

b. There are 4 lines of symmetry. So, you can write $4(m\angle A) = 180°$. The solution is $m\angle A = 45°$.

c. There are 6 lines of symmetry. So, you can write $6(m\angle A) = 180°$. The solution is $m\angle A = 30°$.