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Constructions 2

Parallel Lines, and Angles[1]

Goals

I can:

- construct a perpendicular at the endpoint of a ray.
- construct a line parallel to another line passing through a given point.
- construct a copy of an angle.
- bisect angle

Use a straight edge and a compass perform the following constructions. You may find detailed demonstrations of these constructions at http://www.mathopenref.com/tocs/constructionstoc.html

1. a. Construct a perpendicular at the endpoint of a ray.

b. Why do you think this procedure works?

2. a. Construct a line parallel to $\overleftrightarrow{PR}$ which passes through point Q.

b. Why do you think this construction works?

[1] These materials are based on work done by John Page.

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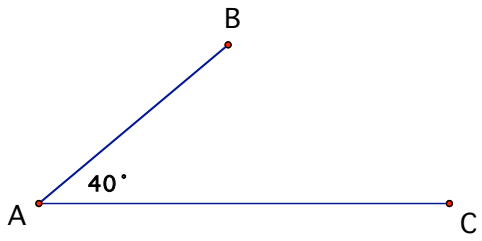
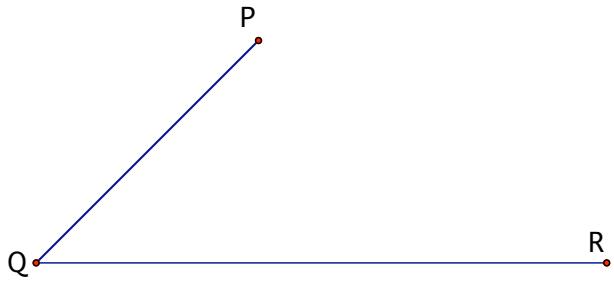
3. a. Construct a copy of the angle below. (Note: the lengths of the sides don't matter.)



b. Why do you think this construction works?

4. a. Construct a bisector of the angle below.



b. Why do you think this construction works?

5. Construct a 45° and then a 22.5° angle.

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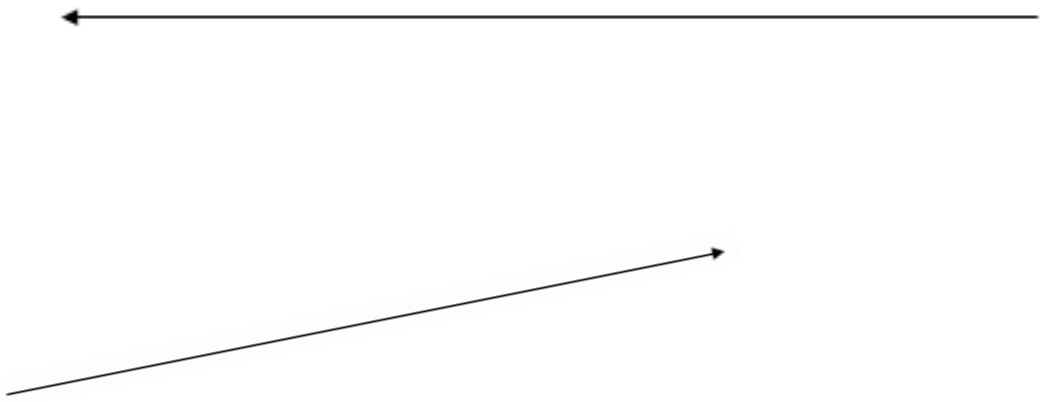
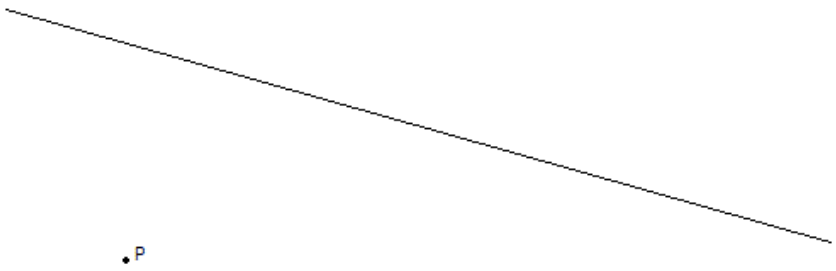
Practice

Use a straight edge and compass for the following problems. Leave clear and complete construction marks to justify you work.

1. Construct a line perpendicular to the endpoints of the rays below.



2. Construct a line parallel to the line below which passes through point P.



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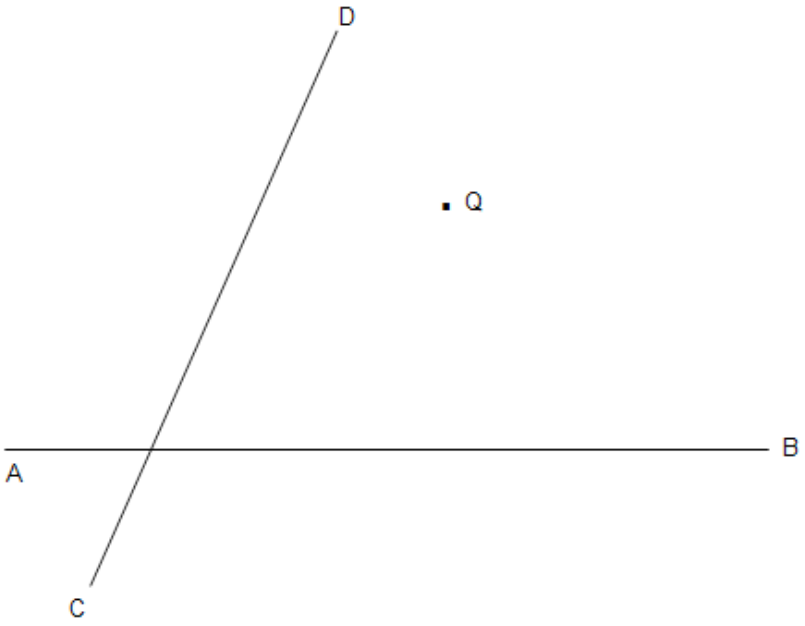
3. a. Construct a line parallel to AB through Q, and another line parallel to CD also through Q

   b. What is the name of the resulting 4-sided shape?



4. Construct a line parallel to side $\overline{CD}$ which passes through the midpoint of side $\overline{CE}$. Do you notice anything interesting?