

Lesson 1.11 Constructions (Perpendicular Lines)

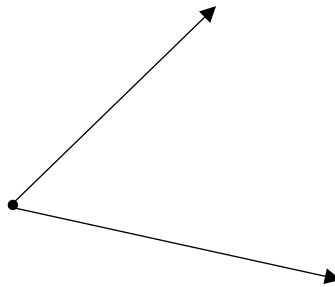
Students will be able to:

- **Content Objective:** Construct a perpendicular line through a point on and off a given line.
- **Language Objective:** Describe the relationship between the construction for angle bisector and perpendicular lines.



Warm Up

Bisect the angle shown below using a compass and straight edge. Be sure to leave all construction marks.



Vocabulary Review

Match each word to the correct description.

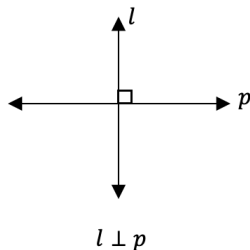
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|---------------------------------|--|
| 1. _____ Perpendicular Lines | a. Divides a segment into two congruent segments and intersects the segment to form right angles |
| 2. _____ Segment Bisector | b. A segment that divides another segment into two congruent pieces |
| 3. _____ Parallel Lines | c. Lines that intersect to form right angles |
| 4. _____ Angle Bisector | d. Divides an angle into two congruent angles |
| 5. _____ Perpendicular Bisector | e. Lines that are equidistant apart and never intersect |



Graphic Organizer

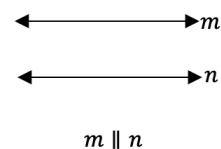
Perpendicular Lines

- Lines that intersect to form 90° (right) angles.



Parallel Lines

- Lines that are equidistant apart and never intersect.



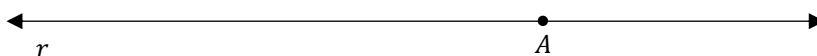
Today, we will be focusing on how to construct perpendicular lines. The construction for parallel lines will come later in the course.

Constructing a Perpendicular Line Through a Point on & off a Given Line


1. Place center of compass on the point you wish to construct a perpendicular line through.
2. Make arc so that it intersects the given line in two places. Extend line if necessary and mark intersection points.
3. Place center of compass on one intersection point and adjust the radius if necessary to make an arc below the line.
4. Repeat step 3 at other intersection point so that your new arc intersects the other arc. Mark intersection point.
5. Draw a line through the original point and the new intersection point you found in step 3. This line is perpendicular to the given line.


Skill 1: Constructing Perpendicular Lines Through a Point on a Given Line

Given line r and point A on line r , construct a line through point A perpendicular to line r . Leave all construction marks and use measurement to verify your construction.


Exercise 1: Constructing Perpendicular Lines Through a Point on a Given Line

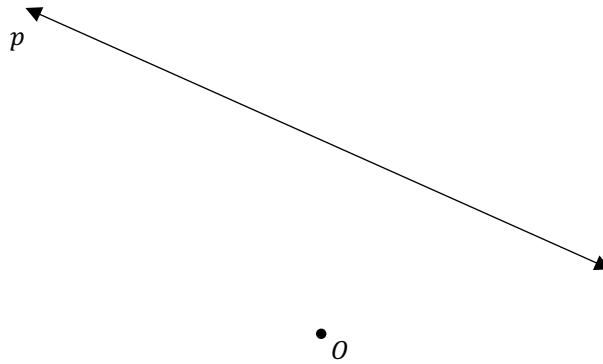
Given line d and point B on line d , construct a line through point B perpendicular to line d . Leave all construction marks and use measurement to verify your construction.





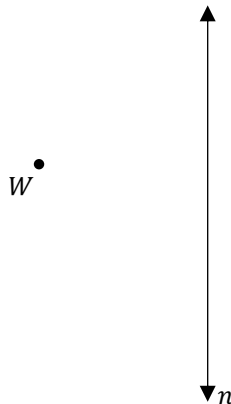
Skill 2: Constructing Perpendicular Lines Through a Point off a Given Line

Given line p and point O *not* on line p , construct a line through point O perpendicular to line p . Leave all construction marks and use measurement to verify your construction.



Exercise 2: Constructing Perpendicular Lines Through a Point off a Given Line

Given line n and point W *not* on line n , construct a line through point W perpendicular to line n . Leave all construction marks and use measurement to verify your construction.



Check Point

When we construct a perpendicular line through a point to a given line, we can think of the perpendicular line as what type of construction? Explain.



1.11- Problem Set

Name: _____

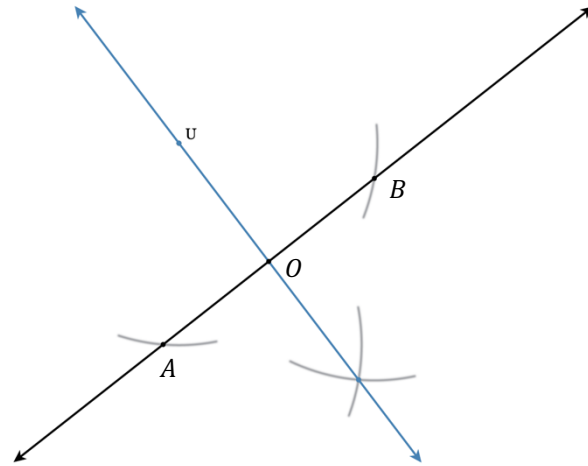
1. Using the illustration shown below, answer the following questions.

a. What type of construction is being shown?

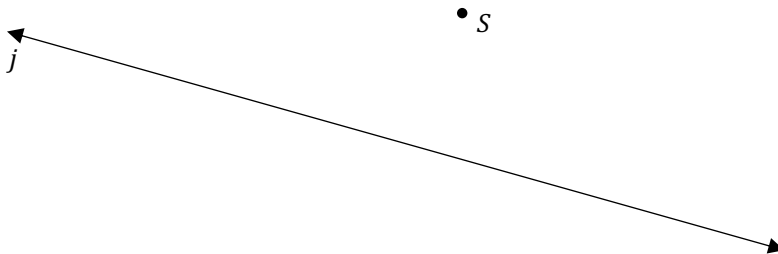
b. What is true about $\angle AOU$ and $\angle BOU$?

c. **Fill in the blank.**

Any point on line UO is _____ from the endpoints A and B .



2. Given line j shown below with point S not on line j , construct a line through point S perpendicular to line j



3. Jeremy is building a shed and must place a beam, going through point P , that is parallel to the ground but perpendicular to the wall of the shed. Using a compass, construct the beam and leave all construction marks.

