The SAT Initiative

G4 Topic Breakdown
SOL - Geometry
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Constructing and Justifying the construction of line segment congruent to a given line segment

1. Measure the original segment length
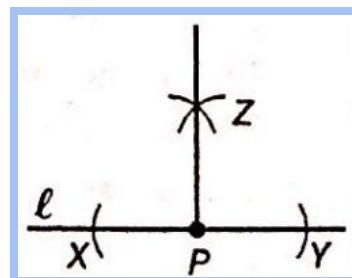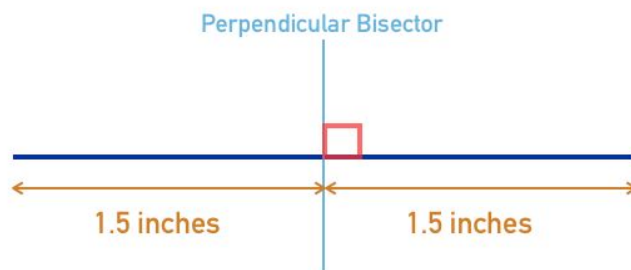
3.5 inches

2. Draw a line of the same length

3.5 inches

3.5 inches

Constructing a perpendicular bisector of line segment

1. Find the midpoint of the line segment (half of the full length)

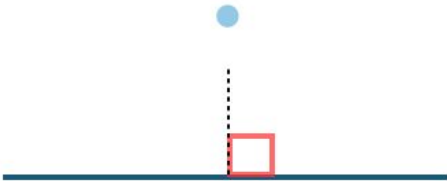1.5 inches   1.5 inches

2. Draw a perpendicular line

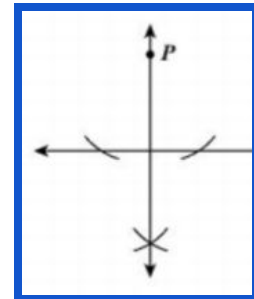Perpendicular Bisector
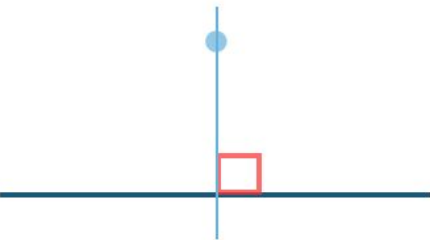
1.5 inches   1.5 inches

Constructing a perpendicular line to a given line from a point not on the line
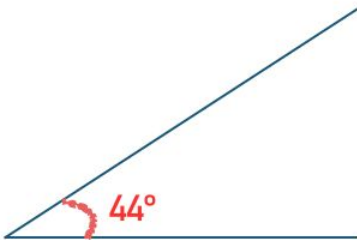
●

_____

1. Measure a right angle

●

2. Move ruler down the line segment until the parallel line connects
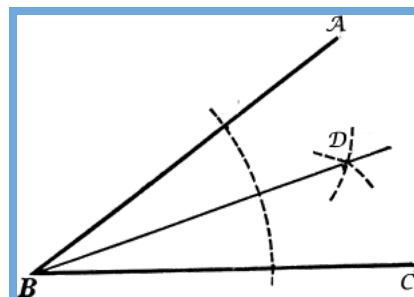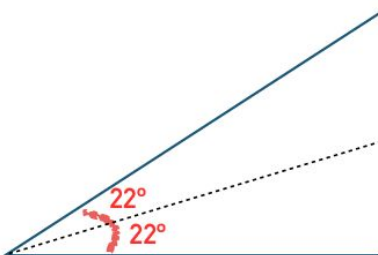

Construct a bisector of a given angle

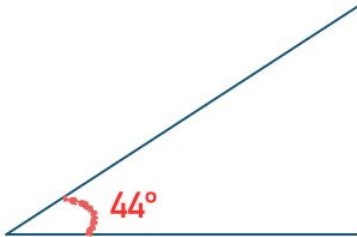1. Measure the degree of the full angle
2. Divide that angle by 2

$$44°/2 = 22°$$

44°

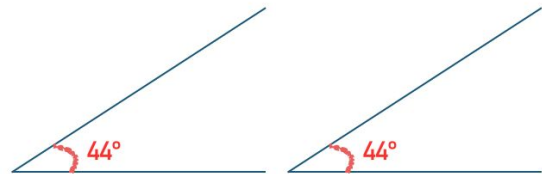3. Draw a line segment going through that angle

22°
22°

Construct an angle congruent to a given angle
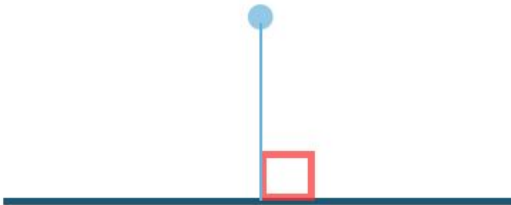
1. Measure the original angle

2. Draw a segment and then draw another segment through the new degree measure
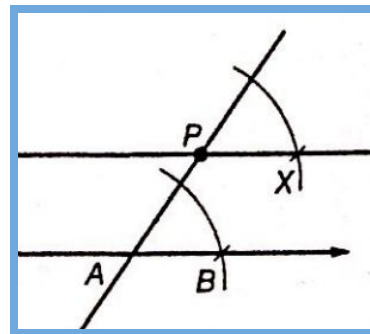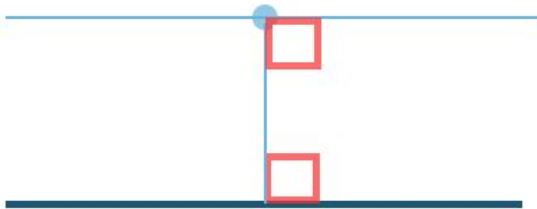
44°

44°   44°

Constructing a line parallel to a given line through a point not the given line

1. Construct a perpendicular bisector though the point

2. Draw a line that is parallel to the perpendicular line constructed

P

X

A   B

More Practice

Which best describes the construction in the diagram shown?
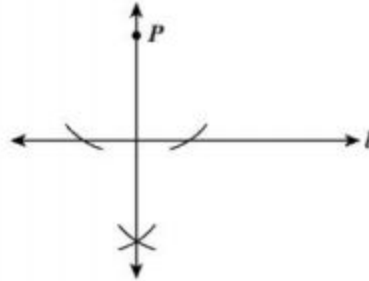
○ **A** The bisector of a line segment

○ **B** A line segment congruent to a given line segment

○ **C** A perpendicular to a given line at a point on the line

○ **D** A perpendicular to a given line from a point not on the line

What type of construction is illustrated in the figure?
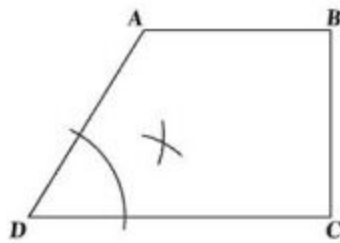
○ **A** The bisection of $\angle D$

○ **B** The bisection of $\overline{BD}$

○ **C** An angle congruent to $\angle D$

○ **D** A line segment congruent to $\overline{AB}$

Practice Problems
G.4 Review

1. Line AB and Point C, not on Line AB, are given. A line perpendicular to Line AB is constructed and it also passes through Point C. These two lines lines intersect at Point D. Which of the following statements is true?
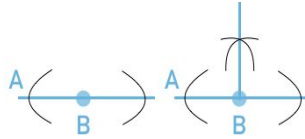
   A) Half of angle CDB is 45°
   B) The sum of Angle CDB and Angle ADC is 90°
   C) Angle BCD is 180°
   D) Double angle CDB is 90°

2. Line A and Point B are given. Arcs are drawn at five different points. What is illustrated in the second image?


   A) A parallel line to Line A
   B) A line segment that is congruent to Line A
   C) A line perpendicular to a given line through a point on the line
   D) A line perpendicular to a given line through a point not on the line

3. Which of the following constructions is depicted in the image below?
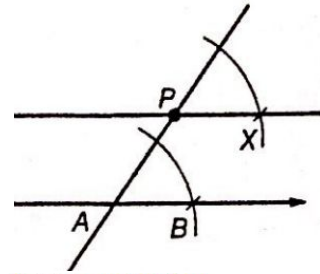
   A) Two parallel lines
   B) A line and another line perpendicular to it
   C) A perpendicular line and a parallel line
   D) Two congruent rays

4. An angle congruent to angle ABC is constructed. Then Line DE and Line FG are drawn as shown. Which line segments are not necssarily congruent to each other?
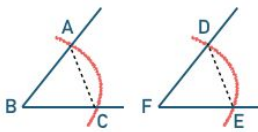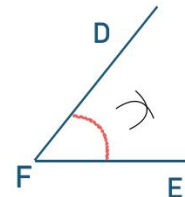

   A) AC and DE
   B) AB and FD
   C) BC and FE
   D) DE and AB

5. Angle ABC is 62°. It is intersected by an angle bisector. Which of the following statements about ABC is true?

   A) One of the new angles formed is obtuse
   B) One of the new angles formed is 31°
   C) The angle bisector forms two 45° angles
   D) The angle bisector is congruent to Line BC

6. Which of the following is depicted in the image below?
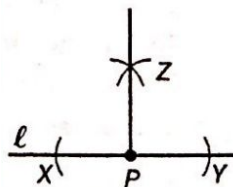

   A) A perpendicular bisector
   B) A parallel line
   C) An angle bisector
   D) A congruent angle

7. The following image shows the initial step (drawing a line through l and a point not on line l) in constructing which of the following?
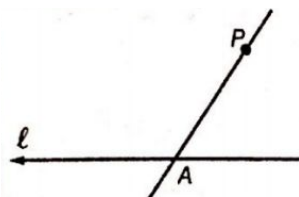
   A) A parallel line
   B) A perpendicular bisector
   C) An congruent angle
   D) None of the above

8. What is true about the lines below?

   A) Line PY equals Line ZP
   B) Angle ZPX is greater than Angle ZPY
   C) Line ZP is equal to line XY
   D) Line XP equals Line PY

9. Which of the following is not a part of the contruction of a parallel line when a point not on the line is given?

   A) Draw a line down the center of the angle
   B) Draw a line between a point and line
   C) Draw an arc from the intersection point on a line
   D) Draw an arc from the point not on the line

Answer Key: Practice Problems

G.4 Geometry

1.	A
2.	C
3.	A
4.	D
5.	B
6.	C
7.	A
8.	D
9.	A