

1

The Questions

IN THIS PART . . .

The best way to become proficient in geometry is through a lot of practice. Fortunately, you now have 1,001 practice opportunities right in front of you. These questions cover a variety of geometric concepts and range in difficulty from easy to hard. Master these problems, and you'll be well on your way to a solid foundation in geometry.

Here are the types of problems that you can expect to see:

- » Geometric definitions (Chapter 1)
- » Constructions (Chapter 2)
- » Geometric proofs with triangles (Chapter 3)
- » Classifying triangles (Chapter 4)
- » Centers of a triangle (Chapter 5)
- » Similar triangles (Chapter 6)
- » The Pythagorean theorem and trigonometric ratios (Chapter 7)
- » Triangle inequality theorems (Chapter 8)
- » Polygons (Chapter 9)
- » Parallel lines cut by a transversal (Chapter 10)
- » Quadrilaterals (Chapter 11)
- » Coordinate geometry (Chapter 12)
- » Transformations (Chapter 13)
- » Circles (Chapters 14 and 15)
- » Surface area and volume of solid figures (Chapter 16)
- » Loci (Chapter 17)

Chapter 1

Diving into Geometry

Geometry requires you to know and understand many definitions, properties, and postulates. If you don't understand these important concepts, geometry will seem extremely difficult. This chapter provides practice with the most important geometric properties, postulates, and definitions you need in order to get started.

The Problems You'll Work On

In this chapter, you see a variety of geometry problems. Here's what they cover:

- » Understanding midpoint, segment bisectors, angle bisectors, median, and altitude
- » Working with the properties of perpendicular lines, right angles, vertical angles, adjacent angles, and angles that form linear pairs
- » Noting the differences between complementary and supplementary angles
- » Using the addition and subtraction postulates
- » Understanding the reflexive, transitive, and substitution properties

What to Watch Out For

The following tips may help you avoid common mistakes:

- » Be on the lookout for when something is being done to a segment or an angle. Bisecting a segment creates two congruent segments, whereas bisecting an angle creates two congruent angles.
- » The transitive property and the substitution property look extremely similar in proofs, making them very confusing. Check whether you're just switching the congruent segments/angles or whether you're getting a third set of congruent segments/angles after already being given two pairs of congruent segments/angles.
- » Make sure you understand what the question is asking you to solve for. Sometimes a question asks only for a particular variable, so as soon as you find the variable, you're done. However, sometimes a question asks for the measure of the segment or angle; after you find the value of the variable, you have to plug it in to find the measure of the segment or angle.

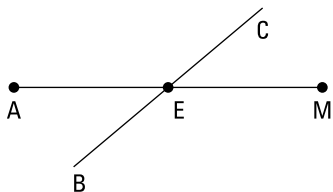
Understanding Basic Geometric Definitions

1–3 Fill in the blank to create an appropriate conclusion to the given statement.

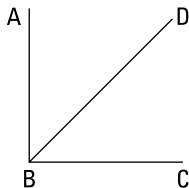
1. If M is the midpoint of \overline{AB} , then $\overline{AM} \cong$ ___.



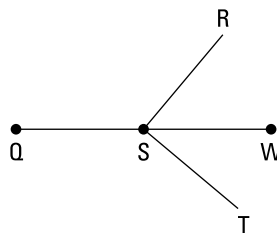
2. If \overline{BC} bisects \overline{AM} at E , then $\overline{AE} \cong$ ___.



3. If $\overline{AB} \perp \overline{BC}$, then _____ is a right angle.

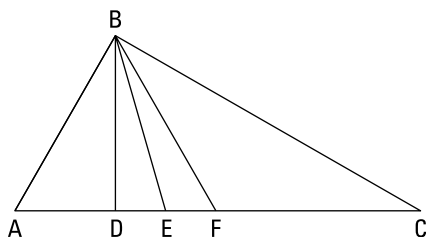


4–9 In the following figure, \overline{QW} bisects $\angle RST$ and $\overline{RS} \perp \overline{TS}$. Determine whether each statement is true or false.



4. $\angle RST$ is a right angle.
5. $\angle RSQ \cong \angle RSW$.
6. $\angle QSR$ and $\angle WSR$ form a linear pair.
7. $\angle WST \cong \angle WSR$.
8. $\angle RSQ$ is an obtuse angle.
9. If Point S is the midpoint of \overline{QW} , then it's always true that $\overline{RS} \cong \overline{TS}$.

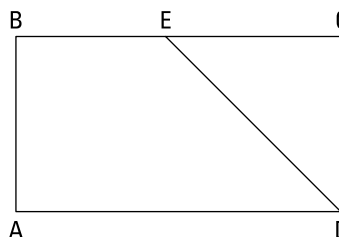
10–14 Use the following figure and the given information to draw a valid conclusion.



10. \overline{BF} is the median of $\triangle ABC$.
11. \overline{BD} is the altitude of $\triangle ABC$.
12. \overline{BE} bisects $\angle ABC$.
13. F is the midpoint of \overline{AC} .
14. F is the midpoint of \overline{AC} . What type of angle does $\angle BFC$ have to be in order for \overline{BF} to be called a perpendicular bisector?

Applying Algebra to Basic Geometric Definitions

15–18 Use the figure and the given information to answer each question.



15. E is the midpoint of \overline{BC} . If $BE = 50$ and $CE = 2x + 25$, find the value of x .
16. \overline{ED} bisects $\angle ADC$. If $m\angle ADE$ is represented by $3x - 5$ and $m\angle CDE$ is represented by $x + 25$, find $m\angle ADC$.
17. If $\overline{BA} \perp \overline{DA}$ and $m\angle BAD$ is represented by $5x - 20$, find the value of x .
18. \overline{DE} bisects \overline{BC} . If $BC = 5x - 3$ and $CE = x + 12$, find the length of \overline{BE} .