Chapter Audio Summary for McDougal Littell
Geometry

Chapter 10 Circles

In Chapter 10 you learned how to identify segments and lines related to circles. You used properties of tangents, arcs, and chords. You also found how angles and arc measures relate to circles. Then you found the lengths of the segments of chords, tangents, and secants. You also found the equation of a circle. At the end of the chapter, you drew loci that satisfied certain conditions.

Turn to the lesson-by-lesson Chapter Review that starts on p. 650 of the textbook.

Lesson 10.1 Tangents to Circles

Important words to know are: *circle, center of a circle, radius of a circle, congruent circles, diameter of a circle, chord, secant, tangent, tangent circles, concentric circles, common tangent, interior of a circle, exterior of a circle,* and *point of tangency.*

The first goal of Lesson 10.1 is to identify segments and lines related to circles. Don't forget that a secant is a line, while a chord is a segment.

The second goal of Lesson 10.1 is to use properties of a tangent to a circle. Look at the diagram in the Examples. $\overline{KS}$ is a tangent, so it is perpendicular to the radius $\overline{RS}$. $\overline{KS}$ is congruent to $\overline{KP}$ because they are two tangents from the same exterior point.

Now try Exercises 1 through 10. If you need help, go to the worked-out Examples on pages 595 through 598.

Lesson 10.2 Arcs and Chords

Important words to know are: *central angle, minor arc and its measure, major arc and its measure, semicircle,* and *congruent arcs.*

The first goal of Lesson 10.2 is to use properties of arcs of circles. The measure of a minor arc is defined to be the measure of its central angle. The measure of a semicircle is 180º. The measure of a whole circle is 360º. Notice that major arcs and semicircles are labeled with three letters and minor arcs are labeled with two letters.

The second goal of Lesson 10.2 is to use properties of chords of circles. In the Examples $\overset{\frown}{WX}$ and $\overset{\frown}{XY}$ are congruent minor arcs with a measure of 75 º. WYX is a major arc, and $mWYX = 360 º – 75 º = 285 º$. $\overset{\frown}{TU}$ is congruent to $\overset{\frown}{UY}$ because $\overline{TU}$ is congruent to $\overline{UY}$. Chord $\overline{WZ}$ is a perpendicular bisector of chord $\overline{UY}$, so $\overline{WZ}$ is a diameter.

Now try Exercises 11 through 16. If you need help, go to the worked-out Examples on pages 603 and 606.

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Lesson 10.3 Inscribed Angles

Important words to know are: *inscribed angle, intercepted arc, inscribed polygon,* and *circumscribed circle.*

The first goal of Lesson 10.3 is to use inscribed angles to solve problems. In the Examples $\angle ABC$ and $\angle ADC$ are congruent, each with a measure of $\frac{1}{2} \cdot m\widehat{AEC} = 90°$.

The second goal of Lesson 10.3 is to use properties of inscribed polygons. Because triangle *ADC* is an inscribed right triangle, $\overline{AC}$ is a diameter. The quadrilateral can be inscribed in the circle because its opposite angles are supplementary.

Now try Exercises 17 through 19. If you need help, go to the worked-out Examples on pages 613 through 616.

Lesson 10.4 Other Angle Relationships in Circles

The first goal of Lesson 10.4 is to use angles formed by tangents and chords to solve problems in geometry. In the first Example, $m \angle ABD = 1/2 (120°) = 60°$.

The second goal of Lesson 10.4 is to use angles formed by lines that intersect a circle to solve real-life problems. To find $m\angle CED$, when the angle is inside the circle, you need to find half the *sum* of the intercepted arcs. $1/2(30° + 40°) = 35°$. To find $m\angle CED$, when it is outside the circle, you need to find half the *difference* of the intercepted arcs. $1/2(100° – 20°) = 40°$.

Now try Exercises 20 through 23. If you need help, go to the worked-out Examples on pages 621 through 623.

Lesson 10.5 Segment Lengths in Circles

Important words to know are: *tangent segment, secant segment,* and *external segment.*

The first goal of Lesson 10.5 is to find the lengths of segments of chords. Remember that if two chords intersect in the interior of a circle, then the product of the lengths of the segments of one chord is equal to the product of the lengths of the segments of the other chord.

The second goal of Lesson 10.5 is to find the lengths of tangents and secants. In the Example, the product of *BF* and *FE* is equal to the product of *AF* and *FD*. The product of *GC* and *GB* is equal to the product of *GD* and *GA*. Also, $(GE)^2 = GD \cdot GA$.

Now try Exercises 24 through 26. If you need help, go to the worked-out Examples on pages 629 through 631.

Lesson 10.6 Equations of Circles

Important words to know are: *standard equation of a circle.*

The first goal of Lesson 10.6 is to write the equation of a circle. To write the standard equation of a circle with center $(-3, -1)$ and radius 2, write the standard equation of a circle, $(x - h)^2 + (y - k)^2 = r^2$. Then substitute (-3) for h, (-1) for k, and 2 for r to get $[x - (-3)]^2 + [y - (-1)]^2 = 2^2$. Finally, simplify to get the solution, $(x + 3)^2 + (y + 1)^2 = 4$.

The second goal of Lesson 10.6 is to use the equation of a circle and its graph to solve problems. Don't forget that the standard equation of a circle involves subtraction signs.

Now try Exercises 27 through 29. If you need help, go to the worked-out Examples on pages 636 and 637.

Lesson 10.7 Locus

An important term to know is: *locus.*

The first goal of Lesson 10.7 is to draw the locus of points that satisfy a certain condition. Use these general steps: 1) Draw any figures that are given in the statement of the problem. 2) Locate several points that satisfy the given condition. 3) Continue drawing points until you can recognize the pattern. 4) Draw the locus and describe it in words.

Notice how the steps are used in the Example. To find the locus of points equidistant from two parallel lines, *r* and *s*, first draw the parallel lines. Locate several points that are equidistant from *r* and *s*. Identify the pattern. The locus is a line parallel to *r* and *s* and halfway between them.

Now try Exercises 30 through 32. If you need help, go to the worked-out Examples on pages 642 through 644.