ALBERT

Name _____ Date _____

Inscribed Angles, Chords and Tangents Worksheet

Geometry · Common Core HSG-C.A.2

> Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.

Practice

Builds the skill step by step.

1. A central angle measures 80°. What is the measure of its intercepted arc?

2. An inscribed angle intercepts an arc of 100°. What is the measure of the inscribed angle?

3. An inscribed angle measures 35°. What is the measure of its intercepted arc?

4. An inscribed angle intercepts a semicircle: its sides end at the two endpoints of a diameter. What is its measure?

5. A radius is drawn to the point where a tangent line touches a circle. What angle does it make with the tangent?

   A. It depends on the circle.

   B. 180°

   C. 45°

   D. 90°

6. A central angle and an inscribed angle intercept the same arc. The central angle is 120°. What is the inscribed angle?

7. Two inscribed angles intercept the same arc. One measures 42°. What does the other measure?

8. A tangent touches circle O at A. OA = 5 and the distance from O to a point P on the tangent is 13. How long is PA?

9. An arc measures 150°. What is the measure of the central angle that intercepts it?

10. Which angle has its vertex on the circle?

    A. an inscribed angle

    B. a central angle

    C. a circumscribed angle

    D. a tangent angle at the center

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On Level

Grade-level practice.

1. △ABC is inscribed in a circle with AB a diameter. m∠A = 28°. What is m∠B?

2. Two tangents from point P touch a circle at A and B. The central angle ∠AOB measures 110°. What is the circumscribed angle ∠APB?

3. Two tangents from point P touch a circle at A and B. PA = 9. What is PB?

4. An inscribed angle measures (3x + 5)° and intercepts an arc of 100°. What is x?

5. Explain why an angle inscribed in a semicircle is a right angle.

6. A chord is 16 units long in a circle of radius 10. How far is the chord from the center?

7. Circumscribed angle ∠APB is formed by tangents at A and B and measures 50°. What is the measure of minor arc AB?

8. A radius is perpendicular to a chord. What does it do to the chord?

   A. It doubles the chord.

   B. It bisects the chord.

   C. Nothing special.

   D. It is tangent to the chord.

9. Points A, B and C are on a circle with center O. m∠AOC = 2x° and m∠ABC = 40°, where ∠ABC is inscribed and intercepts the same arc as ∠AOC. What is x?

10. A circle has radius 8. A tangent from point P touches it at T, and PT = 15. How far is P from the center?

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Challenge

Multi-step and word problems that stretch it.

1. In circle O, inscribed angles ∠ABD and ∠ACD intercept arc AD. m∠ABD = (2x + 10)° and m∠ACD = (4x − 20)°. What is m∠ABD?

2. Tangents from P touch circle O at A and B. OA = 6 and OP = 12. What is the circumscribed angle ∠APB?

3. Prove that the measure of an inscribed angle is half its intercepted arc when one side of the angle is a diameter. Let ∠ABC be inscribed with BC a diameter through center O.

4. A chord is 24 units long and is 5 units from the center of the circle. What is the radius?

5. Points A, B, C and D lie on a circle in that order. Arc AB = 80°, arc BC = 100° and arc CD = 70°. What is the inscribed angle ∠BAD?

6. A line meets a circle at exactly one point and is perpendicular to the radius there. What is the line?

   A. a secant

   B. a chord

   C. a tangent

   D. a diameter

7. Two tangents from P meet a circle at A and B, forming a circumscribed angle of 3x°. The minor arc AB is (5x + 20)°. What is x?

8. A circle has center (0, 0) and radius 5. What is the slope of the tangent line at the point (3, 4)?

9. An inscribed angle and a central angle intercept the same arc. Together they measure 135°. What is the central angle?

10. Inscribed △ABC has AB as a diameter, AC = 7 and BC = 24. What is the radius of the circle?