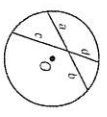


Notes Thurs

10-7 Study Guide and Intervention

Special Segments in a Circle

Segments Intersecting Inside a Circle If two chords intersect in a circle, then the products of the lengths of the chord segments are equal.



$$a \cdot d = c \cdot b$$

Find x:

The two chords intersect inside the circle, so the products $AB \cdot BC = EB \cdot BD$ and $AD \cdot DC = ED \cdot DB$ are equal.

$$AB \cdot BC = EB \cdot BD$$

$$6 \cdot x = 8 \cdot 3$$

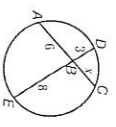
$$6x = 24$$

$$x = 4$$

Substitution

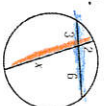
Multiply

Divide each side by 6.



$$AB \cdot BC = EB \cdot BD$$

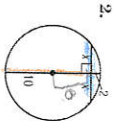
Exercises
Find x. Assume that segments that appear to be tangent are tangent. Round to the nearest tenth if necessary.



$$2x = 3 \cdot 6$$

$$2x = 18$$

$$x = 9$$



$$x^2 = 2(10)$$

$$x^2 = 20$$

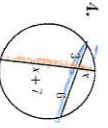
$$x = \sqrt{20}$$

$$x \approx 4.5$$



$$6x = 4 \cdot 8$$

$$x = 10.6$$



$$x(x+7) = 18$$

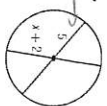
$$x^2 + 7x = 18$$

$$x^2 + 7x - 18 = 0$$

$$(x+9)(x-2) = 0$$

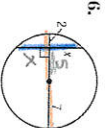
$$x = -9 \text{ or } x = 2$$

$$x = 2$$



$$x+2 = 5$$

$$x = 3$$

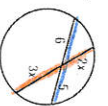


$$x^2 = 2(12)$$

$$x^2 = 24$$

$$x = \sqrt{24}$$

$$x \approx 4.9$$



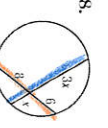
$$2x(3x) = 6 \cdot 5$$

$$6x^2 = 30$$

$$x^2 = 5$$

$$x = \sqrt{5}$$

$$x \approx 2.2$$



$$3x(x) = 3 \cdot 8$$

$$3x^2 = 24$$

$$x^2 = 8$$

$$x = \sqrt{8}$$

$$x \approx 2.8$$

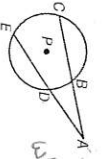
Lesson 10-7

10-7 Study Guide and Intervention (continued)

Special Segments in a Circle

Segments Intersecting Outside a Circle If secants and tangents intersect outside a circle, then two products are equal. A secant segment is a segment of a secant line that has exactly one endpoint on the circle. A secant segment that lies in the exterior of the circle is called an external secant segment. A tangent segment is a segment of a tangent with one endpoint on the circle.

If two secants are drawn to a circle from an exterior point, then the product of the measures of one secant segment and its external secant segment is equal to the product of the measures of the other secant segment and its external secant segment.



secant (outside part)



tangent (side) = whole (outside part)

$AC \cdot AB = AE \cdot AD$
 AC and AE are secant segments.
 AD and AD are external secant segments.

AB is tangent to the circle. Find x . Round to the nearest tenth, and the external secant segment is BD .

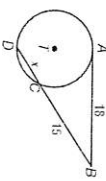
$$(AB)^2 = BC \cdot BD$$

$$(18)^2 = 15(15 + x)$$

$$324 = 225 + 15x$$

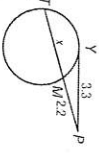
$$99 = 15x$$

$$6.6 = x$$



Exercises

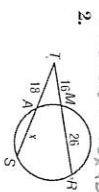
Find x. Round to the nearest tenth. Assume segments that appear to be tangent are tangent.



$$3x = 2(2)$$

$$3x = 4$$

$$x = 1.3$$

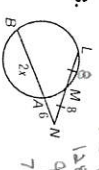


$$16(16+18) = 26(x)$$

$$16(34) = 26x$$

$$544 = 26x$$

$$20.9 = x$$

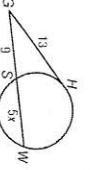


$$8(8+12) = 3(2x)$$

$$8(20) = 6x$$

$$160 = 6x$$

$$26.7 = x$$

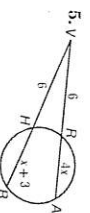


$$13^2 = 9(5x+8)$$

$$169 = 45x + 72$$

$$88 = 45x$$

$$1.95 = x$$

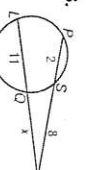


$$6(6+6) = 6(x+3)$$

$$24x + 36 = 6x + 54$$

$$18x = 18$$

$$x = 1$$



$$x(x+11) = 8(10)$$

$$x^2 + 11x = 80$$

$$x^2 + 11x - 80 = 0$$

$$(x+16)(x-5) = 0$$

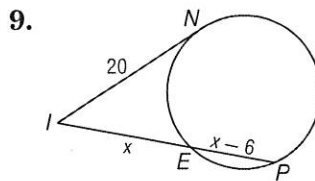
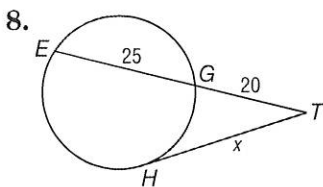
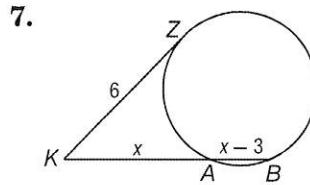
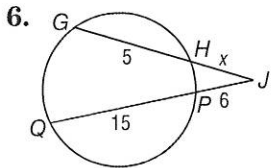
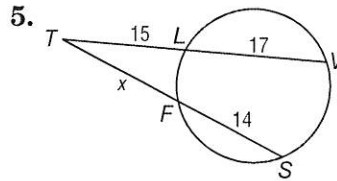
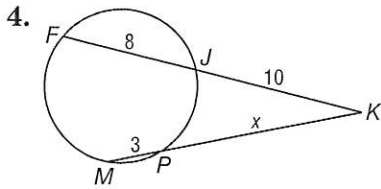
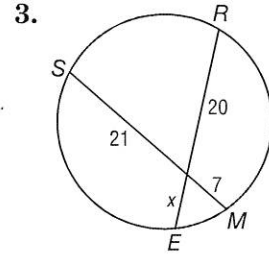
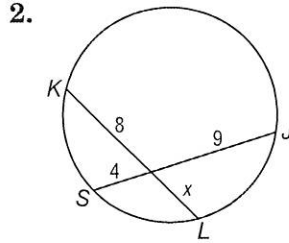
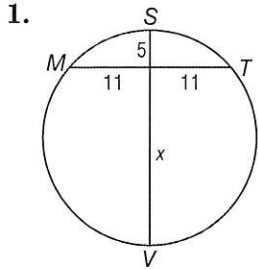
$$x = -16 \text{ or } x = 5$$

$$x = 5$$

10-7 Practice

Special Segments in a Circle

Find x . Assume that segments that appear to be tangent are tangent. Round to the nearest tenth if necessary.



10. **CONSTRUCTION** An arch over an apartment entrance is 3 feet high and 9 feet wide. Find the radius of the circle containing the arc of the arch.

