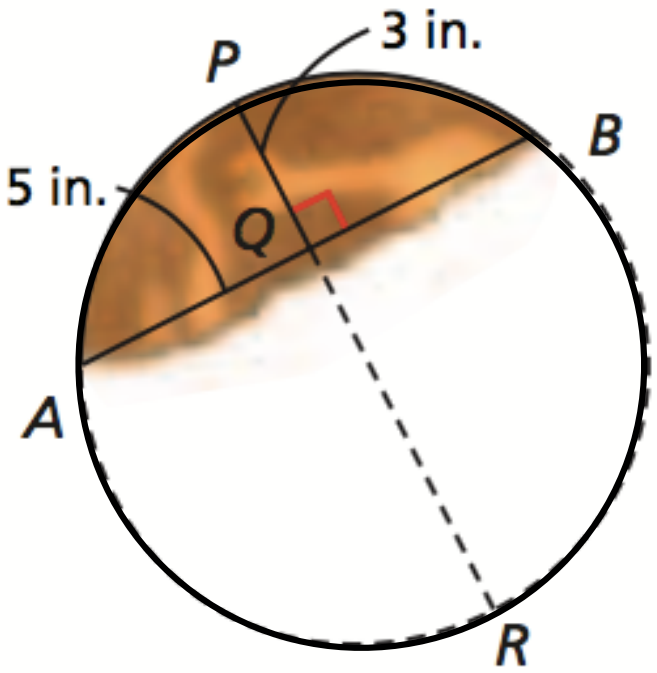
Chapter 10
Circles

10.6 Segment Relationships in Circles

In the Real World

A shard of a Greek discus was found in an archaeological dig.

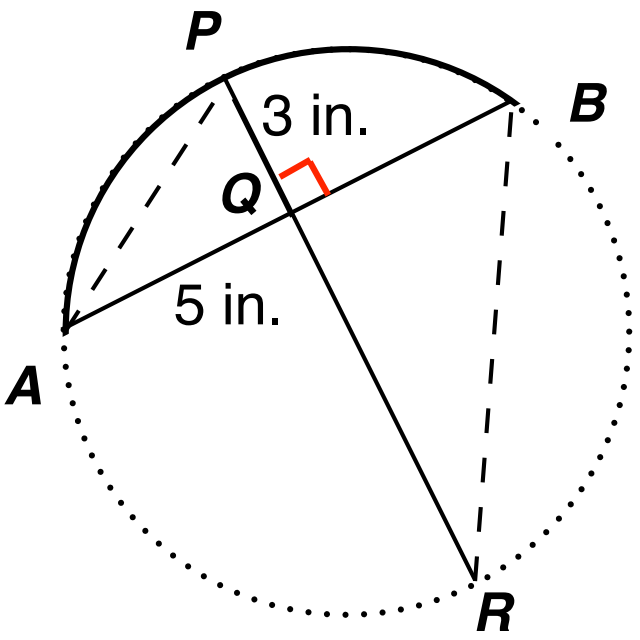


What was the original diameter PR?

10.6 Segment Relationships in Circles

In the Real World

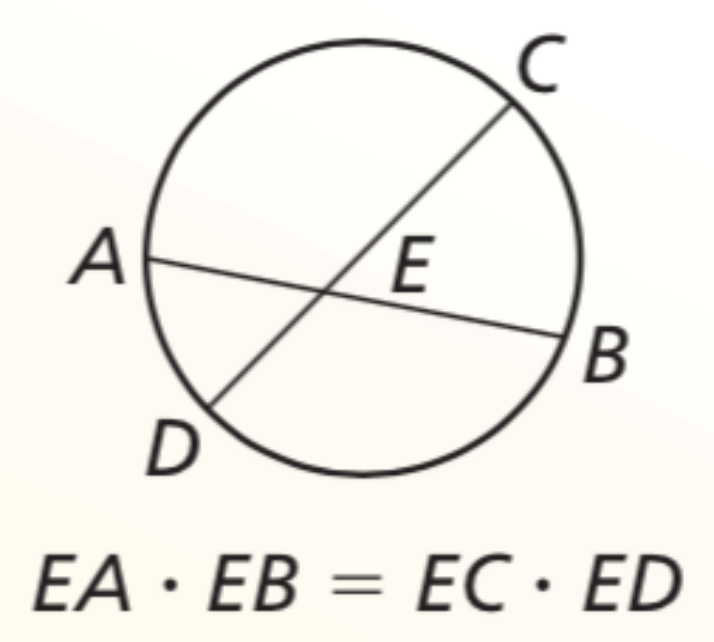
Use inscribed angles and similarity to find the diameter PR.



10.6 Segment Relationships in Circles

Theorem

Segments of Chords Theorem	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.

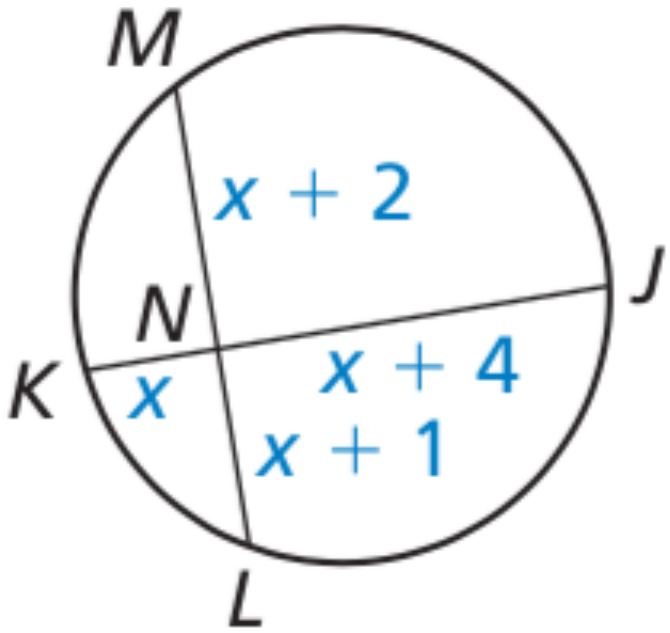


$$EA \cdot EB = EC \cdot ED$$

10.6 Segment Relationships in Circles

Example

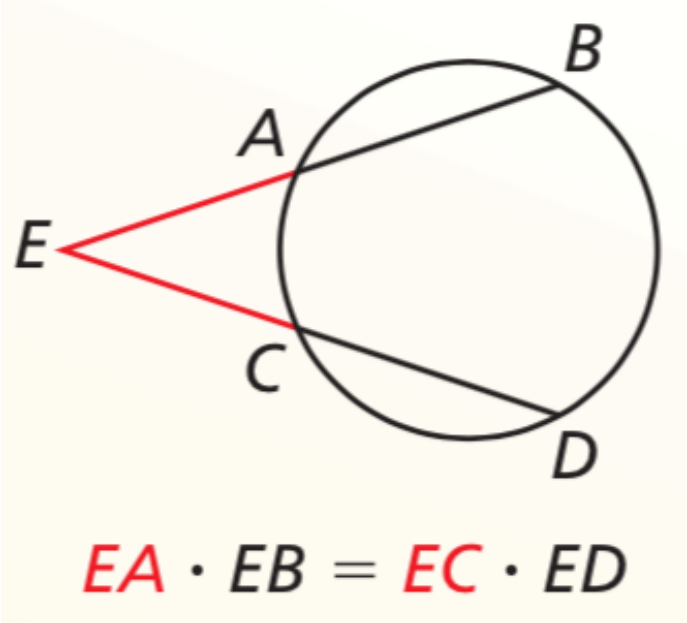
Calculate ML and JK.



10.6 Segment Relationships in Circles

Theorem

Segments of Secants Theorem	If two secant segments share the same endpoint outside a circle, then the product of the lengths of one secant segment and its external segment equals the product of the lengths of the other secant segment and its external segment.



outside • whole = outside • whole

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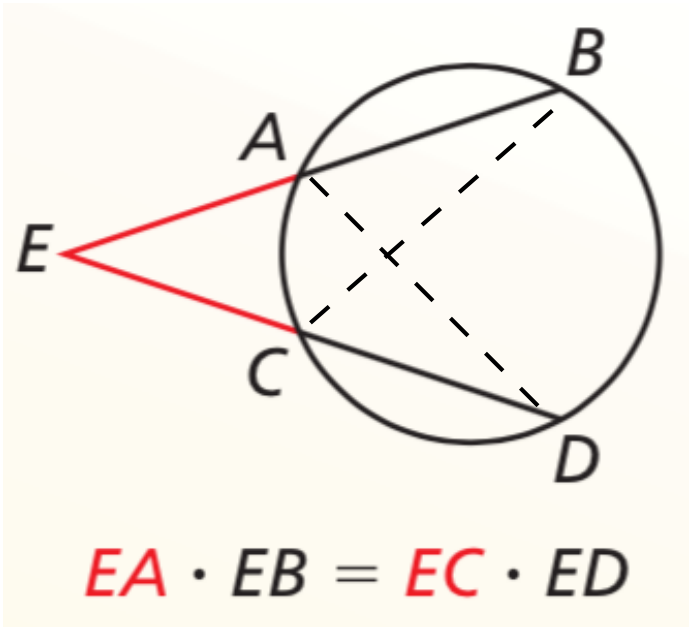
Why?

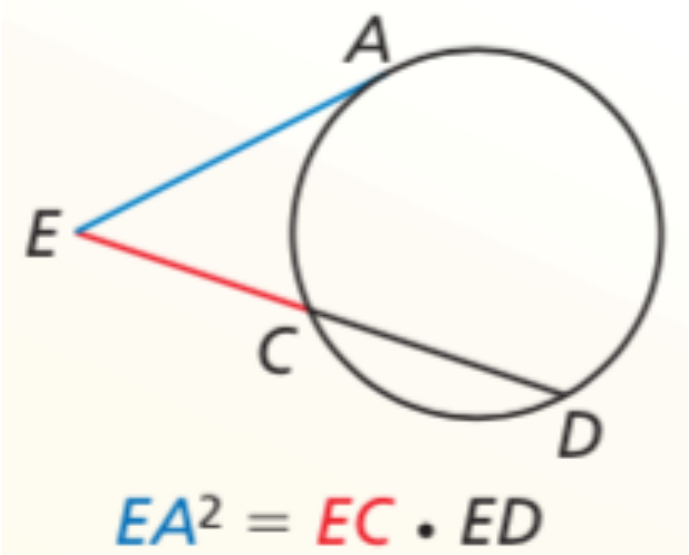


outside • whole = outside • whole

10.6 Segment Relationships in Circles

Theorem

Segments of Secants and Tangents Theorem	If a secant segment and a tangent segment share an endpoint outside a circle, then the product of the lengths of the secant segment and its external segment equals the square of the length of the tangent segment.



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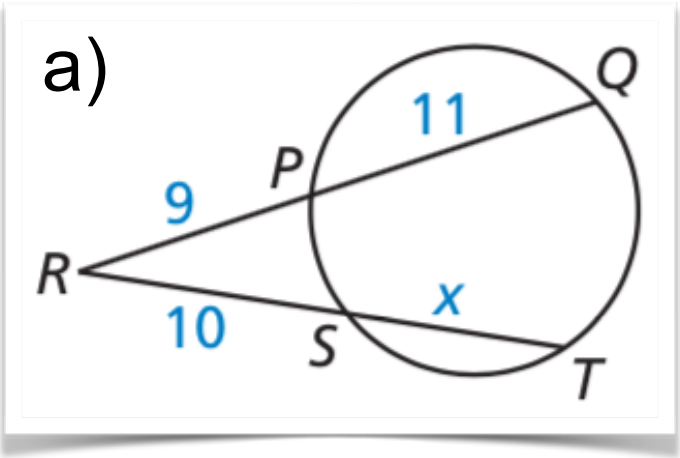
Examples

Calculate x.

a)



b)