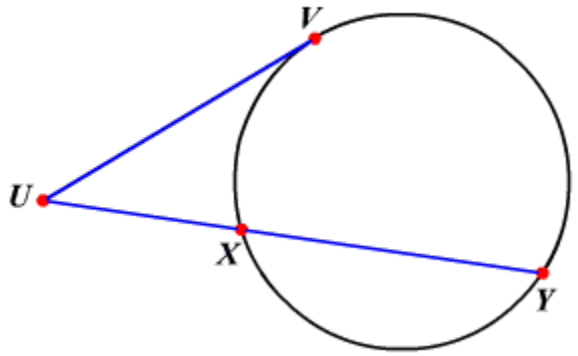
Homework 3 **Name_____**

1. Prove following theorems:
    a. The line from the centre of a circle to the midpoint of a chord is perpendicular to the chord.
    b. Equal chords in equal circles are equidistant from the centres.
    c. Chords in a circle which are equidistant from the centre are equal.
    d. The products of the intercepts of two intersecting chords are equal.
    e. Angles in the same segment are equal.
    f. The angle in a semicircle is a right angle.
    g. Opposite angles of a cyclic quadrilateral are supplementary.
    h. The exterior angle at a vertex of a cyclic quadrilateral is equal to the interior opposite angle.
    i. The products of the intercepts of two intersecting chords are equal.
    j. The products of the intercepts of two intersecting secants to a circle from an external point are equal.
    k. Tangents to a circle from an external point are equal.
    l. The angle between a tangent and a chord through the point of contact is equal to the angle in the alternate segment.
2. Prove: The square of the length of the tangent from an external point is equal to the product of the intercepts of the secant passing through this point. (Grades 4-6 may not know how to handle similar triangles. Teacher will introduce similar triangles in class)



3. How many times in a day do the minute and hour hands of a clock coincide (Angle between them is zero) with each other?

4. How many times in a day do the minute and hour hands of clock form a 180° straight line in a day?