Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**Day 3 – Tangent Properties**

Last unit, you learned that tangent lines intersect a circle in exactly one place. This leads to several theorems about tangent lines.

**Tangent Circles** are two coplanar circles that intersect at exactly one point. They may intersect internally or externally.



**Common Tangent Lines** are lines that are tangent to two circles.



**Example:** Draw any common tangent lines.



**Other Points of Intersection:**

Circles may also intersect at two or no points.



**No Points of Intersection:**

These circles are called **Concentric Circles**. They have no points of intersection but they have the same center and different radii.

**No Points of Intersection:**

No points of intersection with different centers.

**Two Points of Intersection**

 **Tangent Theorems**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Theorem** | **Hypothesis** | **Conclusion** |
| **Perpendicular Tangent Theorem** | If a line is tangent to a circle, then it is perpendicular to the radius drawn to the point of tangency.  |  |  |
| **Converse of Perpendicular Tangent Theorem** | If a line is perpendicular to a radius of a circle at a point on the circle, then the line is tangent to the circle.  |  |  |
| **Tangent Segments Theorem** | If two segments are tangent to a circle from the same external point, then the segments are congruent. |  |  |

**Example:** Is AB tangent to Circle C? **Example:** Find the length of RQ. **Example:** Find x.



**Example:** Find perimeter of triangle ABC. **Example:** Find DF if you know that DF and DE are tangent to.

