

regular polygon, find the side of a similar circumscribed one.

3. Describe a circle that shall touch a given straight line and pass through two given points, through which the straight line that passes will meet the given line.
4. Two straight lines being given, find their point of intersection, and also their angle of intersection.
5. Find the polar Equation to the Ellipse, the pole being in the focus.
6. Find also the Equation to the tangent.
7. In an Ellipse the rectangle under the perpendiculars from the foci on the tangent at any point is equal to the square of the semiaxis minor.
8. In the same curve $SP \cdot PH = CD^2$, and $CP^2 + CD^2 = AC^2 + BC^2$.
9. In an Ellipse $CD \cdot PF = AC \cdot BC$.
10. Define the circle of curvature in any curve, and find the chords of curvature parallel to the axis, and through the focus, and also the diameter of curvature, in the Parabola.

THIRD PAPER.

1. How do you determine, whether a quantity has a maximum or minimum value, or not, and, if it has, how do you determine, whether that value is a maximum or a minimum?
2. Describe about a given circle the least isosceles triangle.
3. Derive from the Exponential Theorem the differential of a^x . Differentiate y^{xz} , $\frac{a^x - 1}{a^x + 1}$; integrate $\frac{3dx}{a+x}$, $\frac{xdx}{1 + \frac{4x^2}{a^2}}$.
4. Find from the expansion of $\text{Log}(1+x)$ a rapidly converging series for the calculation of logarithms.
5. Find the differential of the arc of a circle in terms of the sine, and apply it to find the circumference of a circle.
6. Find the area of a parabola; the solidity of a paraboloid.