SESSION 1877-78.

FACULTY OF ARTS.

HONOUR PAPERS.

MATHEMATICS.

1. No Equation can have more positive roots than changes of signs from + to —, and from — to + in its terms, nor can it have more negative roots than successive repetitions of the same sign.

2. Find all the roots of the Equation $x^3-7x^2+16x-12=0$, two roots being equal.

3. Find the roots of $x^3-3x^2-6x+8=0$, the roots being in A. P.

4. Transform into an Equation having integral coefficients $x^4-\frac{5}{6}x^3+\frac{5}{12}x^2-\frac{7}{150}x-\frac{13}{900}=0$

5. Form the Equation whose roots are the roots of $x^3+18x^2+99x+81=0$, each divided by -3.

6. Solve the Equation $x^5-\frac{15}{2}x^4+\frac{37}{2}x^3-\frac{37}{2}x^2+\frac{15}{2}x-1=0$.

7. Find the roots of the Equation $x^3-7x^2+14x-20=0$.

8. Find the roots of $x^3-7x+6=0$, by Trigonometry.

9. If the roots of $x^3-px^2+qx-r=0$ are in H. P., shew that the mean root $=\frac{r}{\frac{1}{3}q}$, and thence find the roots of $x^3-11x^2+36x-36=0$.

10. $x^3-5x^2+16x-12=0$, and $x^3-2x^2-15x+16=0$, have one root common: find the roots.

11. Solve by Ferrari's method $x^4-4x^3-8x+32=0$.

SECOND PAPER.

1. Find the value, in terms of the radius, of the side of a decagon inscribed in a circle.

2. Given the radius of a circle, and the side of an inscribed