equal, but if they are not, that it lies between the greatest and least.

7. Find the square root of
$4x^4 + 25x^2 + 16 - 12x^3 - 24x$.

8. Solve the equations:

(1) $\frac{2x-1}{20} - \frac{x+2}{3x-4} = \frac{x+\frac{1}{2}}{10} - \frac{7}{12}$.

(2) $\left.\begin{aligned} \frac{1}{x+y} + \frac{1}{x-y} &= \frac{3}{5} \\ \frac{1}{x-y} - \frac{1}{x+y} &= \frac{x+2}{x^2-y^2} \end{aligned}\right\}$

(3) $\left.\begin{aligned} 2x + 3y &= 19 \\ 4y + 5z &= -8 \\ 6z + 7x &= 11 \end{aligned}\right\}$

State any general principles used in solving (1).

9. Solve with respect to x the equation $x^2 + px + q = 0$; and shew that if α, β be values of x which satisfy this equation, $\alpha + \beta = -p$, $\alpha\beta = q$.

10. Sum to 10 terms and also to n terms:
(1) $1\frac{1}{2} + 2\frac{1}{4} + 3 + \ldots$.
(2) $27 - 18 + 12 - \ldots$.

11. Find what number of terms of the series $30 + 26 + 22 + \ldots$ will make up 126. Interpret any peculiarity in the result.

12. The 3rd term of a G. S. is 4, and the 7th is $\frac{1}{4}$, find the series and the limit of its sum to infinity.

13. If a slice 2 feet thick be cut off parallel to one side of a cube, and a slice 3 feet thick parallel to another side, the bulk of the remainder is to that of the cube as 5 : 8. Find the size of the cube.

14. If \$1 Canada cy. be equivalent to \$1.90 U. S. cy. the value of a parcel of dollar notes partly Canadian, partly U. S. is \$825 Canada cy., but if the numbers of the two kinds were interchanged, the value would be \$915. Find the number of each sort.

15. Whether the number of bushels of wheat grown on a farm be 100 less than in a certain year while the price per bushel is \$0.15 more, or the number of bushels be 50 more while the price is \$0.10 less, the value of the crop is the same as in the first year. Find the number of bushels grown the first year and the price per bushel.

GEOMETRY.

(Three hours allowed.)

I. If one side of a triangle be produced, the exterior angle is greater than either of the interior opposite angles.

II. Parallelograms upon the same base, and between the same parallels, are equal to one-another.

III. To describe a parallelogram equal to a given rectilineal figure, and having an angle equal to a given rectilineal angle.

IV. If a straight line be divided into two equal parts, and also into two unequal parts, the rectangle contained by the unequal parts, together with the square on the line between the points of section is equal to the square on half the line.

V. If a straight line be divided into two equal, and also into two unequal parts, the squares on the two unequal parts are together double of the square on half the line, and of the square on the line between the points of section.

VI. To describe a square that shall be equal to a given rectilineal figure.

VII. If one circle touch another internally in any point, the straight line which joins their centres being produced, shall pass through that point of contact.

VIII. Upon a given straight line, to describe a segment of a circle which shall contain an angle equal to a given rectilineal angle.

IX. The angle at the centre of a circle is double of the angle at the circumference, upon the same base, that is, upon the same part of the circumference.

X. To inscribe a circle in a given triangle.

XI. To describe an isosceles triangle, having each of the angles at the base double of the third angle.

XII. To inscribe a circle in a given equilateral and equiangular pentagon.

XIII. To determine that point in a straight line from which the straight lines drawn to two other given points shall be equal, provided the line joining the two given points is not perpendicular to the given line.

XIV. If from the base to the opposite sides of an isosceles triangle three straight lines be drawn, making equal angles with the base, viz., one from its extremity, the other two from any other point in it, these two shall be together equal to the first.

XV. If in the diagonal of a parallelogram, any two points equi-distant from its extremities be joined with the opposite angles, a figure will be formed which is also a parallelogram.

XVI. Produce a given straight line in such a manner that the square on the whole line shall be equal to twice the square of the given line.

XVII. Prove that the square on any straight line drawn from the vertex of an isosceles triangle to