

times the sum of the numbers multiplied by their product.

3. Solve the equations :

$$(a) \frac{2x}{5} - \frac{3}{6} = 12.$$

$$(b) (x+7)^2 + (5-x)(x+5) = 36x.$$

4. (a) What is the price of bread per loaf if an increase of 25 per cent. in the price would reduce the number of loaves that could be purchased for one dollar by two?

(b) The breadth of a field is two-thirds of its length; if the breadth is increased by 100 yards, and the length diminished by the same amount, the new area is equal to the old. Find the length of the field.

5. (a) Factor $x^6 - 64$; $x^4 + x^2y^2 + y^4$.

(b) Show that $x+y$ is a factor of $\{1 - m(x+py)\}^3 + \{mx + (1-p)y\}^3$.

(c) Factor $16a^2 + 4ab - 4ac - 12b^2 + 17bc - 6c^2$.

6. Simplify

$$(a) \frac{(101)^4 - (99)^4}{(101)^2 + (99)^2}.$$

$$(b) \frac{(p-a)}{(a-b)(a-c)} + \frac{(p-b)}{(b-c)(b-a)} + \frac{(p-c)}{(c-a)(c-b)}.$$

7. Define axiom, postulate, hypothesis. State Euclid's postulates.

8. If two triangles have two angles of the one equal to two angles of the other, each to each, and one side equal to one side, namely sides which are opposite to equal angles in each, the two triangles are equal in all respects.

Show that every point in the bisector of an angle is equidistant from the sides of the angle.

9. If two angles of a triangle be equal to one another, the sides subtending those angles are equal.

Find a point on the given straight line AB such that the distances from two given points on the same side of and without AB shall be equal.

If the given points be on a line at right angles to AB , how must they be placed to render the problem possible?

JUNIOR LEAVING AND UNIVERSITY PASS MATRICULATION.

NOTE.—Candidates for Junior Matriculation will take sections A and B, and Candidates for the Junior Leaving, sections B and C.

A.

1. To construct a triangle whose three sides shall be respectively equal to three given lines, the sum of every two of which is greater than the third.

Give reasons for considering the condition embodied in the above enunciation a necessary condition.

2. The triangle formed by joining the middle point of one of the non-parallel sides of a trapezium to the extremities of the opposite side is equal to half the trapezium.

3. In the triangle ABC the angle A equals the sum of the angles B and C . If from the vertex A a right line be drawn to the middle point of the opposite side it is equal to half that side.

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

5. In equal circles equal angles at the centres or at the circumferences stand upon equal arcs.

B.

6. If a straight line be bisected and produced to any point the square on the whole line thus produced and the square on the part of it produced are together double of the square on half the line bisected and of the square on the line made up of the half and the part produced.

7. If a line be a tangent to a circle and from the point of contact a chord be drawn cutting the circle, the angles made by this line with the tangent are respectively equal to the angles in the alternate segments of the circle.

8. Inscribe in a given triangle a parallelogram whose diagonals shall intersect in a given point.