Mathematics with a compass and a straightedge.

Problems.

Problem 1. Using only a compass, construct a 1^o arc on a circle, if a 19^o arc of this circle is given.

Using only a compass and a straightedge:

Problem 2. Construct the bisector of the given angle.

Problem 3. Construct a triangle with the given three sides.

Problem 4. Construct an angle congruent to the given angle.

Problem 5. Construct a perpendicular from the given point to the given line.

Problem 6. Construct a line passing through the given point and parallel to the given line.

Problem 7. Bisect the given straight segment.

Problem 8. Construct a triangle with the given base, an angle at the base, and the sum of other two sides.

Problem 9. Divide the given angle into 8 congruent parts.

Problem 10. Construct a triangle given two sides and the angle between them.

Problem 11. Construct a triangle given one side and two angles adjacent to it.

Problem 12. Construct a triangle given two sides and the angle opposite to the greater one of them.

Problem 13. Construct a right triangle given two legs.

Problem 14. Construct a right triangle given one leg and the hypotenuse.

Problem 15. Construct a right triangle given one leg and the adjacent acute angle.

Problem 16. Construct an isosceles triangle given one of the congruent sides and the altitude to the base.

Problem 17. Construct an isosceles triangle given the altitude to the base and the angle at the vertex.

Problem 18. Construct an isosceles triangle given the bases and the altitude to another side.

Problem 19. Construct a triangle given two sides and the angle between them.

Problem 20. Through an interior point of an angle construct a line that cuts off congruent segments on the sides of the angle.

Problem 21. Find a point equidistant from the three vertices of a given triangle.

Problem 22. Given a point A on one of the sides of an angle B find a point C on the other side of the angle such that the sum $|CA| + |CB|$ equals to the length of a given segment.

Problem 23. Through a given point construct a line parallel to the given line.

Problem 24. Construct an equilateral triangle given its altitude.

Problem 25. Construct a polygon congruent to a given one.

Problem 26. Through an interior point of an angle construct a line such that its line segment contained between the sides of the angle is bisected by the given point.

Problem 27. Divide the given segment in three congruent parts.

Problem 28. Construct a segment of the length equal to $5/7$ of the length of the given segment.

Problem 29. Construct a polygon congruent to a given one.

Problem 30. Construct a segment the length of which equals the arithmetic mean of lengths of two given segments.

Problem 31. Construct a segment the length of which equals the geometric mean of lengths of two given segments.

Problem 32. Construct a square the area of which equals the area of the given rectangle.

Problem 33. Construct a rectangle with a given side the area of which equals the area of the given rectangle.

Problem 34. Given segments of the lengths p and q, construct a segment

of the length x such that $x^2 + 2px - q^2 = 0$.

Problem 35. Using only a compass and a straightedge find a positive root of the equation $x^2 + 6x - 16 = 0$.

Problem 36. Using only a compass and a straightedge find a positive root of the equation $x^2 + 5x - 9 = 0$.

Problem 37. Construct a triangle given its altitudes.

Problem 38. Approximate the number π.

References.

1. Kiselev's GEOMETRY. Book 1. Planimetry by A.P. Kiselev. Adapted from Russian by Alexander Givental. Sumizdat 2006.