

343. Perpendiculars are drawn from any point within an equilateral triangle on the three sides: shew that their sum is invariable.

344. Find a point within a triangle such that if straight lines be drawn from it to the three angular points the triangle will be divided into three equal triangles.

345. From a point E in the common base of two triangles ACB , ADB , straight lines are drawn parallel to AC , AD , meeting BC , BD at F , G : shew that FG is parallel to CD .

346. From any point in the base of a triangle straight lines are drawn parallel to the sides: shew that the intersection of the diagonals of every parallelogram so formed lies in a certain straight line.

347. In a triangle ABC a straight line AD is drawn perpendicular to the straight line BC which bisects the angle B : shew that a straight line drawn from D parallel to BC will bisect AC .

348. ABC is a triangle; any straight line parallel to BC meets AB at D and AC at E ; join BE and CD meeting at F : shew that the triangle ADF is equal to the triangle AEF .

349. ABC is a triangle; any straight line parallel to BC meets AB at D and AC at E ; join BE and CD meeting at F : shew that if AF be produced it will bisect BC .

350. If two sides of a quadrilateral figure be parallel to each other, any straight line drawn parallel to them will cut the other sides, or those sides produced, proportionally.

351. ABC is a triangle; it is required to draw from a given point P , in the side AB , or AB produced, a straight line to AC , or AC produced, so that it may be bisected by BC .

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352. The side BC of a triangle ABC is bisected at D , and the angles ADB , ADC are bisected by the straight lines DE , DF , meeting AB , AC at E , F respectively: shew that EF is parallel to BC .

353. AB is a diameter of a circle, CD is a chord at right angles to it, and E is any point in CD ; AE and BE