27. Altitudes
Construct the 3 altitudes and the orthic triangle of triangle PQR. (The orthic triangle is the triangle formed by the feet of the altitudes.)
28. Half Regular Tetrahedron

Construct a net for half a regular tetrahedron. Specifically, this will be the net for a tetrahedron formed by cutting in two a regular tetrahedron with edge length $s$, cutting along one of its planes of symmetry.

$S$
29. **Square-based Pyramid (corner vertex)**

Construct a net for a square-based pyramid ABCDE. The square base ABCD has side length $s$ and the top vertex $E$ is placed so that $AE$ is perpendicular to the plane of $ABCD$, with $AE = s$. 

![Diagram of S]
30. **Square-based Pyramid (center vertex)**

Construct a net for a square based pyramid ABCDE formed from one square face ABCD of a cube of side s and E, the center of the cube.

S
**31. Light Path**

Construct a point C on line k so that the path from A to C to B is the shortest possible. Specifically, the sum of lengths AC + CB should be smaller than for any other point C on k. This is the path a beam of light would take from A to B if reflected off a mirror k.
32. Triangular Billiards

Imagine that XYZ is a triangular billiard table. Construct the path of a billiard ball that is banked first off side XZ and then off side YZ before it reaches B.
33. Triple Line Reflection (parallels)
Let reflection in parallel lines m1, m2, m3 be M1, M2, M3. Construct a line n so that reflection in n is the same transformation as the composition M3 M2 M1.
34. **Triple Line Reflection (concurrent)**

Let reflection in concurrent lines $m_1$, $m_2$, $m_3$ be $M_1$, $M_2$, $M_3$. Construct a line $n$ so that reflection in $n$ is the same transformation as the composition $M_3 M_2 M_1$. 
35. Composition of two point symmetries

Given the points A and B, let $H_A$ and $H_B$ denote the point reflections with centers A and B. Let $S$ be the composition $H_B H_A$. Construct points $P' = S(P)$ and $Q' = S(Q)$. 
36. Barycentric Coordinates

In this triangle, construct the point P with barycentric coordinates $1/3$, $1/6$, $1/2$. Also, construct the point Q with barycentric coordinates $x$, $y$, $z$, where the segment EF has length 1.