1) Determine and/or Compute ϕ, λ, θ, x, y, k … for all known points

2) Inverse between known points and determine baseline azimuth and distance

3) Compute rough azimuths and rough distances to the triangulated point from both base points using the raw angles, the baseline distance, and the law of sines

4) Traverse to the triangulated point from both base points and determine rough coordinates for the new point

5) Compute the spherical excess using the raw angles and the baseline distance
   Note – the baseline distance (a) must be in miles
   the spherical excess (E) will be in seconds

$$Area = \frac{a^2 \cdot \sin B \cdot \sin C}{2 \cdot \sin A} \qquad E = \frac{Area}{75.6}$$

6) Compute the angular error and correct the raw geodetic angles

$$PerAngleCorrection = \frac{180° + E - AngleSum}{3}$$

7) Second Term (2 places): $$\theta' = A \cdot (X_2 - X_1) \cdot \left(Y_1 - Y_0 + \frac{Y_2 - Y_1}{3} \right)$$ *seconds!*

$A = 2.36 \cdot 10^{-10}$ for all NAD27 zones in the United States

Grid Angle: $$\beta = \alpha - \theta'_{BS} + \theta'_{FS}$$

α (geodetic angle)
β (grid angle)

8) Compute final azimuths and final distances to the triangulated point from both base points using the final angles, the baseline distance, and the law of sines

9) Traverse to the triangulated point from both base points and determine final grid coordinates for the new point

10) Compute final geodetic coordinates from the final grid coordinates