

Double3 TransformSystemG::CartesianCoordinateTransform_ToWGS84(const double x, const double y, const double z)

```
{
    constexpr double a = 6378137.0;    // unit meter
    constexpr double b = 6356752.314245; // unit meter
    constexpr double a2 = a * a;
    constexpr double b2 = b * b;
    constexpr double e2 = (a2 - b2) / a2;
    constexpr double c2 = (a2 - b2) / b2;
    double p = sqrt(z * z + x * x);
    double R = sqrt(p * p + y * y);
    double tanBeta = (b * y) / (a * p) * (1 + c2 * b / R);
    double beta = atan(tanBeta);
    double sinBeta = sin(beta);
    double cosBeta = cos(beta);
    double tanLat = (y + c2 * b * sinBeta * sinBeta * sinBeta) / (p - e2 * a * cosBeta * cosBeta * cosBeta);
    double tanLon = x / (-z);
    double lat = atan(tanLat);
    double lon = atan(tanLon);
    lon = z > 0 ? (x > 0 ? lon + PI : lon - PI) : lon;
    double v = a / sqrt(1 - e2 * sin(lat) * sin(lat));
    double alt = p * cos(lat) + y * sin(lat) - a2 / v;

    return Double3(lat, lon, alt);
}
```