```cpp
1  #include "Polygon.h"
2  #include <cmath>
3
4  float Polygon::getSignedArea() const noexcept {
5      float lArea = 0.0f;
6      for (size_t i = 0; i < fNumberOfVertices; ++i) {
7          size_t j = (i + 1) % fNumberOfVertices;
8          lArea += fVertices[i].x() * fVertices[j].y();
9          lArea -= fVertices[j].x() * fVertices[i].y();
10     }
11     return lArea / 2.0f;
12 }
13
14 Polygon Polygon::transform(const Matrix3x3& aMatrix) const noexcept {
15     Polygon lTransformedPolygon;
16     for (size_t i = 0; i < fNumberOfVertices; ++i) {
17         const Vector3D& lVertex3D = Vector3D(fVertices[i].x(), fVertices
             [i].y(), 1.0f);
18         Vector3D lTransformedVertex = aMatrix * lVertex3D;
19         lTransformedPolygon.fVertices[i] = Vector2D(lTransformedVertex.x
             (), lTransformedVertex.y());
20     }
21     lTransformedPolygon.fNumberOfVertices = fNumberOfVertices;
22     return lTransformedPolygon;
23 }
```