MBMT Geometry Round — Euclid Answers

1. What is the perimeter of a rectangle if its area is 24 and one side length is 6?
   Answer: 20

2. John moves 3 miles south, then 2 miles west, then 7 miles north, and then 5 miles east. What is the length of the shortest path, in miles, from John's current position to his original position?
   Answer: 5

3. An equilateral triangle ABC is drawn with side length 2. The midpoints of sides AB, BC, and CA are constructed, and are connected to form a triangle. What is the perimeter of the newly formed triangle?
   Answer: 3

4. Let triangle ABC have sides $AB = 74$ and $AC = 5$. What is the sum of all possible integral side lengths of BC?
   Answer: 666

5. What is the area of quadrilateral $ABCD$ on the coordinate plane with $A(1,0)$, $B(0,1)$, $C(1,3)$, and $D(5,2)$?
   Answer: $\frac{15}{2}$

6. Let $ABCD$ be a square with side length 30. A circle centered at the center of $ABCD$ with diameter 34 is drawn. Let E and F be the points at which the circle intersects side AB. What is EF?
   Answer: 16

7. What is the area of the quadrilateral bounded by $|2x| + |3y| = 6$?
   Answer: 12

8. A circle O with radius 2 has a regular hexagon inscribed in it. Upon the sides of the hexagon, equilateral triangles of side length 2 are erected outwards. Find the area of the union of these triangles and circle O.
   Answer: $12\sqrt{3}$