*In 1 – 6, refer to the regular pentagon EFGHI below.*

1. Suppose the ***regular*** pentagon EFGHI to the right is dilated about point J with a scale factor of 15. What is the perimeter of its image under this dilation?

2. Suppose the regular pentagon EFGHI is dilated by a scale factor of 10 about vertex E. What is the perimeter of its image under this dilation?
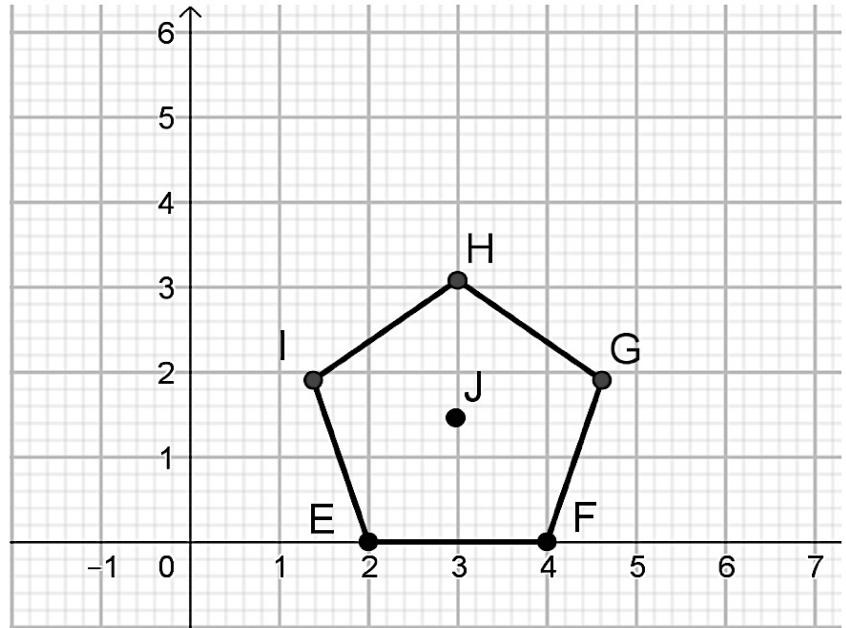
3. Suppose pentagon EFGHI above is first translated via $T(x, y) = (x - 2, y + 3)$, reflected about the line $y = 2x$, rotated about the point $(4, -2)$, and then dilated about point J with scale factor 3. What is the perimeter of the resulting pentagon?

4. Suppose we wish to create a regular pentagon with perimeter 100. By what scale factor do we need to dilate pentagon EFGHI above?

5. Suppose we wish to create a regular pentagon with perimeter 35. By what scale factor do we need to dilate pentagon EFGHI above?

6. Suppose pentagon ABCDE is *not* a regular pentagon and the lengths of its five sides are 4, 5, 5, 4, and 3. By what scale factor do we need to dilate pentagon ABCDE in order for its image to have perimeter 99? How about 100?

7. Referring to rectangle NOPQ below, suppose S is the similarity transformation defined as a clockwise rotation of 30° centered at P, followed by a reflection about the line OP, followed by a dilation about P with a scale factor of 4. After completing the similarity transformation, the resulting rectangle is ABCD such that ABCD ~ NOPQ.
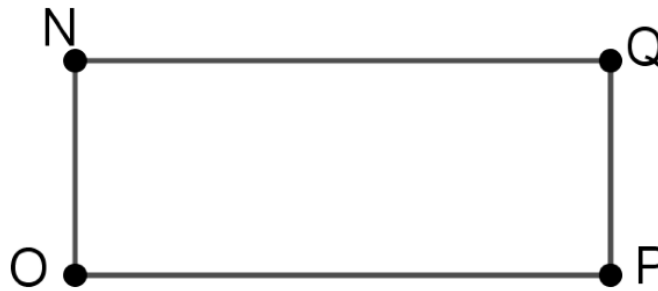
A. If rectangle NOPQ has perimeter of 6 in., then what is the perimeter of ABCD?

B. If rectangle NOPQ has area 6 in.^{2}, then what is the area of ABCD?

C. If rectangle NOPQ has perimeter 25 cm., then what is the perimeter of ABCD?

D. If rectangle NOPQ has area 25 cm.^{2}, then what is the area of ABCD?

E. If rectangle ABCD has an area of 288 ft.^{2}, then what is the area of NOPQ?

F. If rectangle ABCD has a perimeter of 300 m., what is the perimeter of NOPQ?