G.MG.A.3: Perimeter

1. The lengths of the sides of home plate in a baseball field are represented by the expressions in the accompanying figure.

Which expression represents the perimeter of the figure?
1) $5xyz$
2) $x^2 + y^3z$
3) $2x + 3yz$
4) $2x + 2y + yz$

2. The Pentagon building in Washington, D.C., is shaped like a regular pentagon. If the length of one side of the Pentagon is represented by $n + 2$, its perimeter would be represented by
1) $5n + 10$
2) $5n + 2$
3) $n + 10$
4) $10n$

3. The second side of a triangle is two more than the first side, and the third side is three less than the first side. Which expression represents the perimeter of the triangle?
1) $x + 5$
2) $2x - 1$
3) $3x - 1$
4) $x^2 - x - 6$

4. Pentagon $ABCD$ is similar to pentagon $FGHIJ$. The lengths of the sides of $ABCD$ are 8, 9, 10, 11, and 12. If the length of the longest side of pentagon $FGHIJ$ is 18, what is the perimeter of pentagon $FGHIJ$?
1) 50
2) 56
3) 75
4) 100

5. An engineer measured the dimensions for a rectangular site by using a wooden pole of unknown length $x$. The length of the rectangular site is 2 pole measures increased by 3 feet, while the width is 1 pole measure decreased by 4 feet. Write an algebraic representation, in terms of $x$, for the perimeter of the site.

6. In the accompanying diagram, the perimeter of $\triangle MNO$ is equal to the perimeter of square $ABCD$. If the sides of the triangle are represented by $4x + 4$, $5x - 3$, and 17, and one side of the square is represented by $3x$, find the length of a side of the square.
7 In the accompanying diagram, $CD$ is an altitude of \( \triangle ABC \). If $CD = 8$, \( m \angle A = 45 \), and \( m \angle B = 30 \), find the perimeter of \( \triangle ABC \) in simplest radical form.

![Triangle Diagram]

8 The plan of a parcel of land is represented by trapezoid $ABCD$ in the accompanying diagram. If the area of $\triangle ABE$ is 600 square feet, find the minimum number of feet of fence needed to completely enclose the entire parcel of land, $ABCD$.

![Trapezoid Diagram]

9 Mr. James wanted to plant a garden that would be in the shape of a rectangle. He was given 80 feet of fencing to enclose his garden. He wants the length to be 10 feet more than twice the width. What are the dimensions, in feet, for a rectangular garden that will use exactly 80 feet of fencing?

10 Manuel plans to install a fence around the perimeter of his yard. His yard is shaped like a square and has an area of 40,000 square feet. The company that he hires charges $2.50 per foot for the fencing and $50.00 for the installation fee. What will be the cost of the fence, in dollars?
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Answer Section

1. ANS: 4  REF: 010603a

2. ANS: 1
   \[5(x + 2) = 5x + 10\]
   REF: 089905a

3. ANS: 3
   First side: \(x\)
   Second side: \(x + 2\), \(x + x + 2 + x - 3 = 3x - 1\)
   Third side: \(x - 3\)
   REF: 060611a

4. ANS: 3
   The perimeter of \(ABCDE\) is 50 \((8 + 9 + 10 + 11 + 12)\). \(FGHIJ\) is 1.5 \(\frac{18}{12}\) times larger than \(ABCDE\).
   \[50 \times 15 = 75\]
   REF: 080814a

5. ANS:
   \[6x - 2. \quad (2x + 3) + (x - 4) + (2x + 3) + (x - 4)\]
   \[6x - 2\]
   REF: 080124a

6. ANS:
   \[4x + 4 + 5x - 3 + 17 = 4(3x)\]
   \[9x + 18 = 12x \quad s = 3x = 3(6) = 18\]
   \[x = 6\]
   REF: 080537a

7. ANS:
   \[24 + 8\sqrt{2} + 8\sqrt{3}\]. Because \(\triangle CDA\) is an isosceles right triangle, the ratio of its hypotenuse to its legs is \(\sqrt{2} : 1:1\). Because \(\triangle CDB\) is a 30°-60°-90° triangle, the ratio of its hypotenuse to its legs is \(2: \sqrt{3}:1\). \(24 + 8\sqrt{2} + 8\sqrt{3}\)
   REF: 060931b
8. ANS:
260. If \( CD = 40 \), then \( BE = 40 \), which is the base of the shaded triangle. To find the height, or the length of \( \overline{EA} \),
\[
600 = \frac{1}{2} \cdot 40 \cdot h
\]
\( h = 30 \)
\( \Delta ABE \) is a multiple of the 3-4-5 triangle, with legs of 30 and 40 and a hypotenuse of 50.
The perimeter of trapezoid ABCD is \( 70 + 40 + 70 + 30 + 50 = 260 \).

REF: 060134a

9. ANS:

\[
\begin{align*}
10 \times 30. & \quad (2w + 10) + w + (2w + 10) + w = 80 & \quad l = 2w + 10 \\
6w + 20 & = 80 & \quad l = 2(10) + 10 \\
w & = 10 & \quad l = 30
\end{align*}
\]

REF: 060536a

10. ANS:
2,050. If the yard has an area of 40000 square feet, the length of one side of the square yard is 200 feet. The yard has a perimeter of 800 feet. \( 800 \times 2.5 + 50 = \$2050 \)

REF: 080639a