Class Practice on Formulas #2

1. Using the formula for the area of a rectangle \( A = lw \), find the length of a rectangle if the area is 36 square feet and the width is 4 feet. (Show work and write your answer with an appropriate unit.)

2. Given \( A = 8x \), solve for \( x \). (Show all steps.)

3. Given \( A = 8x + 4 \), solve for \( x \). (Show all steps.)

4. Given \( A + B = \frac{1}{2}y - 7 \), solve for \( y \). (Show all steps.)

5. Using the formula for the perimeter of a rectangle \( P = 2l + 2w \), find \( w \) when \( P = 41 \) feet and \( l = 12 \) feet. (Show work and write your answer with an appropriate unit.)
Answers

1. Using the formula for the area of a rectangle $A = lw$, find the length of a rectangle if the area is 36 square feet and the width is 4 feet. (Show work and write your answer with an appropriate unit.)

\[ A = lw \]

First, we solve for $l$ by dividing both sides by $w$.

\[ \frac{A}{w} = \frac{lw}{w} \]

On the right-hand side, the $w$'s cancel.

\[ \frac{A}{w} = l \quad \text{or} \quad l = \frac{A}{w}. \]

So, \[ l = \frac{A}{w} = \frac{36 \text{ feet}^2}{4 \text{ feet}} = 9 \text{ feet} \quad \leftarrow \text{Answer} \]

2. Given $A = 8x$, solve for $x$. (Show all steps.)

\[ A = 8x \]

First we divide both sides of the equation by 8.

\[ \frac{A}{8} = \frac{8x}{8} \]

On the right-hand side of the equation, the 8's cancel.

\[ \frac{A}{8} = x \quad \text{or} \quad x = \frac{A}{8} \quad \leftarrow \text{Answer} \]

3. Given $A = 8x + 4$, solve for $x$. (Show all steps.)

\[ A = 8x + 4 \]

First we subtract 4 from both sides of the equation.

\[ A - 4 = 8x \]

Next we divide both sides of the equation by 8.

\[ \frac{A - 4}{8} = \frac{8x}{8} \]

On the right-hand side of the equation, the 8's cancel.

\[ \frac{A - 4}{8} = x \quad \text{or} \quad x = \frac{A - 4}{8} \quad \leftarrow \text{Answer} \]
4. Given \( A + B = \frac{1}{2}y - 7 \), solve for \( y \). (Show all steps.)

First we add 7 to both sides.

\[
A + B + 7 = \frac{1}{2}y - 7 + 7
\]

\[
A + B + 7 = \frac{1}{2}y
\]

Next we multiply both sides of the equation by 2.

\[
2(A + B + 7) = 2\left(\frac{1}{2}y\right)
\]

The \( 2 \)'s on the right-hand side will cancel.

So, \( y = 2(A + B + 7) \) ← Answer

5. Using the formula for the perimeter of a rectangle \( P = 2l + 2w \), find \( w \) when \( P = 41 \) feet and \( l = 12 \) feet. (Show work and write your answer with an appropriate unit.)

\[
P = 2l + 2w \]

We will solve the equation for \( w \).

\[
P - 2l = 2w
\]

Next, divide both sides of the equation by 2.

\[
\frac{P - 2l}{2} = \frac{2w}{2}
\]

On the right-hand side the \( 2 \)'s will cancel.

So, \( w = \frac{P - 2l}{2} = \frac{41 - 2(12)}{2} = \frac{41 - 24}{2} = \frac{17}{2} = 8.5 \) feet ← Answer