

Application #1

Two triangles have the same base length, represented by x . The height of one triangle is $x+1$. The height of the other triangle is $x+3$. Write and simplify an expression that represents the total area of the two triangles.

$$\begin{aligned}\text{Area 1} &= \frac{b \times h}{2} \\ &= \frac{(x)(x+1)}{2}\end{aligned}$$

$$\begin{aligned}\text{Area 2} &= \frac{b \times h}{2} \\ &= \frac{(x)(x+3)}{2}\end{aligned}$$

$$\begin{aligned}\text{Total Area} &= \frac{x(x+1)}{2} + \frac{(x)(x+3)}{2} \\ &= \frac{x^2 + x + x^2 + 3x}{2} \\ &= \frac{2x^2 + 4x}{2} \\ &= \frac{2x(x+2)}{2} \\ &= x(x+2)\end{aligned}$$

Application #2

Rectangle **A** and Rectangle **B** each have a length of $2x+1$. Rectangle **A** has an area of $6x^2+5x+1$ and Rectangle **B** has an area of $4x^2-4x-3$. Find an expression that represents the ratio of width **A** to width **B**.

Rect A

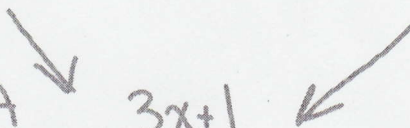
$$\begin{aligned}\text{Area} &= 6x^2 + 5x + 1 \\ &= (3x+1)(2x+1)\end{aligned}$$

$$\therefore \text{width} = 3x+1$$

Rect B

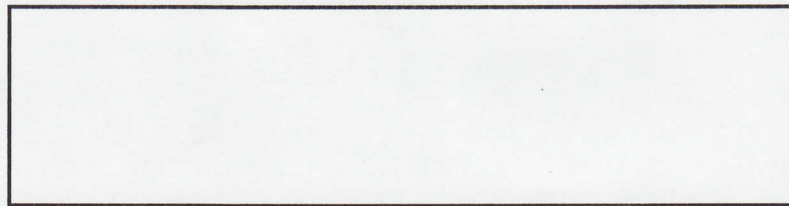
$$\begin{aligned}\text{Area} &= 4x^2 - 4x - 3 \\ &= (2x-3)(2x+1)\end{aligned}$$

$$\therefore \text{width} = 2x-3$$

$$\frac{\text{Area A}}{\text{Area B}} = \frac{3x+1}{2x-3}$$


A rectangle is 6 times as long as it is wide. Determine the ratio of its area to its perimeter, in simplest form, if its width is represented by $w+3$.

$w+3$



$$\begin{aligned}\text{width} &= w+3 \\ \text{length} &= 6w+18\end{aligned}$$

$$\begin{aligned}\text{Area} &= (6w+18)(w+3) \\ &= 6(w+3)(w+3)\end{aligned}$$

$$\begin{aligned}\text{Perimeter} &= 14w+42 \\ &= 14(w+3)\end{aligned}$$

$$\begin{aligned}\frac{\text{Area}}{\text{Perimeter}} &= \frac{6(w+3)(w+3)}{14(w+3)} \\ &= \frac{3(w+3)}{7}\end{aligned}$$