

Coordinate Proofs

Do triangles P and Q have equal areas?

Triangle P

The highest y coordinate is 2 and the lowest is -1

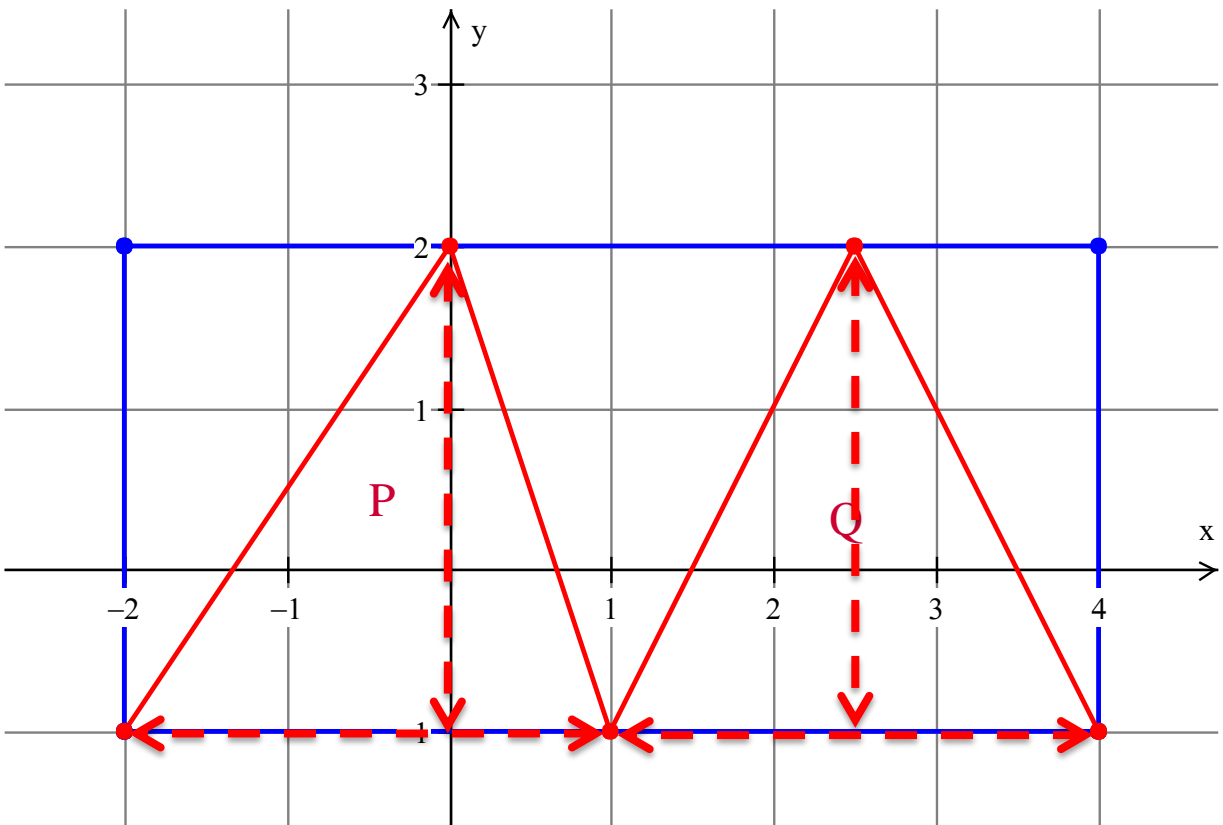
$$h = 3$$

The base runs from -2 to 1
 $b = 3$

$$A_P = \frac{1}{2} 3 \times 3 = \frac{9}{2}$$

Triangle Q

The highest y coordinate is 2 and the lowest is -1



$$h = 3$$

The base runs from 1 to 4

$$b = 3$$

$$A_Q = \frac{1}{2} 3 \times 3 = \frac{9}{2}$$

$$A_Q = A_P$$

What's the difference between the area of the blue and red triangles?

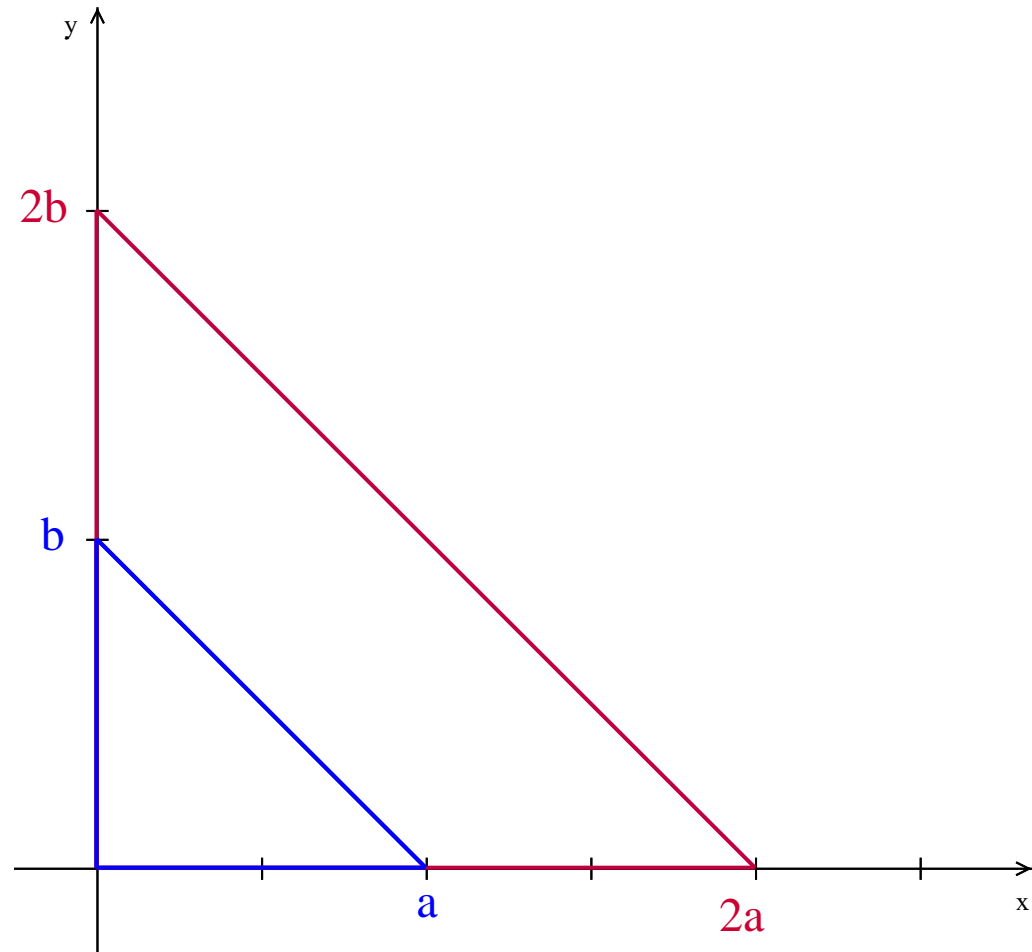
Prove that doubling both the base and the height of a right triangle quadruples the area

Let's start by adding generic values to the x and y axis

$$A = \frac{1}{2} ab$$

$$A = \frac{1}{2} 2a2b = 2ab$$

$$A_{red} = 2ab = 4\left(\frac{1}{2} ab\right) = 4A_{blue}$$



So doubling each dimension does in fact quadruple the area