

The sum of two positive numbers is five times their difference. What is the ratio of the larger number to the smaller number?

$$x, y > 0. \text{ WLOG suppose } x > y$$

$$x + y = 5(x - y)$$

$$\Rightarrow x + y = 5x - 5y$$

$$\Rightarrow 0 = 4x - 6y$$

$$\Rightarrow 4x = 6y$$

$$\Rightarrow \boxed{\frac{x}{y} = \frac{6}{4} = \frac{3}{2}}$$

A box contains a collection of rectangular and triangular tiles. There are 25 tiles in the box with 84 edges total. How many of each type of tile?

Let T be the number of triangular tiles and R be the number of rectangular tiles.

Then

$$T + R = 25 \quad - \quad (1)$$

$$3T + 4R = 84 \quad - \quad (2)$$

We have

$$(1) \Rightarrow T = 25 - R$$

Sub into (2) :

$$3(25 - R) + 4R = 84$$

$$\Rightarrow 75 - 3R + 4R = 84$$

$$\Rightarrow 75 + R = 84$$

$$\Rightarrow R = 9$$

$$\Rightarrow T = 25 - 9 = 16$$

So there are 16 triangular tiles
9 rectangular tiles