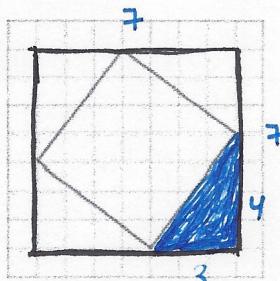


### Section 1.3 – Measuring Line Segments

We can use what we know about the area of squares and triangles to find the area of tilted squares.

For example:



IT TURNS OUT, THE AREA OF THE 4 TRIANGLES IS EQUAL TO THE AREA OF THE SQUARE.

What is the area of the larger square?  $A = b \times h = 7 \times 7 = \boxed{49}$

- Make sure you DRAW A SQUARE THAT ENCLOSES THE INSIDE SQUARE

What is the area of one triangle?  $A = \frac{b \times h}{2} = \frac{3 \times 4}{2} = 6$

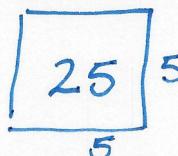
$$\text{A square inside} = \text{A large square} - 4 \text{ triangles}$$

$$49 - 24 = \boxed{25}$$

Using this information, what is the area of the inside square?  $\boxed{25}$

~~Area of inside square = triangles (4) =  $4 \times 6 = 24$  taken from area of larger square~~

Therefore, the side length is  $\boxed{\sqrt{25}} = \boxed{5}$ .



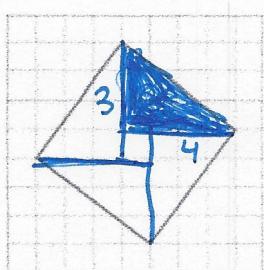
$A = 25$  means side length = 5  
 $A = 5 \times 5$

We can also simply use \_\_\_\_\_.

See below:

Area = 4 equal triangles +

1 small inside square



• Area 1 triangle =  $\frac{3 \times 4}{2} = \frac{12}{2} = 6$

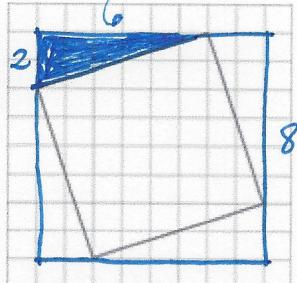
4 triangles =  $4 \times 6 = \boxed{24}$

• Area of inside square =  $1 \times 1 = b \times h = \boxed{1}$

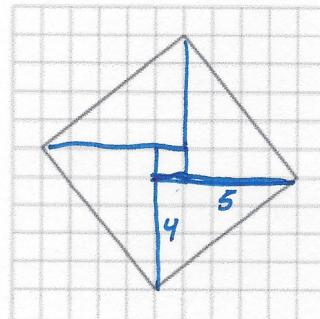
Total area =  $24 + 1 = \boxed{25}$

In the following two diagrams, find the length of the tilted square using whichever method you prefer:

a)



b)



- Area of square is equal to the area of 4 equal triangles subtracted from Area of bigger square.

$$\text{Area of 1 triangle} = \frac{6 \times 2}{2} = 6$$

- Area of 4 triangles

$$6 \times 4 = 24$$

- Area of bigger square

$$\text{Area } \square = 8 \times 8 = 64$$

- Area of inside square

$$\text{Area of Square} - \text{Area of 4 triangles}$$

$$\boxed{\text{Area} = 64 - 24 = 40 \text{ units}}$$

- Area of square is equal to the area of 4 triangles plus the area of 1 square.

$$\text{Area of 1 triangle} = \frac{5 \times 4}{2} = 10$$

- Area of inside square

$$\text{Area} = b \times h = 1 \times 1 = 1$$

Total Area

$$\underbrace{(4 \times 10)}_{\text{area of triangles}} + 1 = 40 + 1 = \boxed{41}$$

Textbook: Page 20, #'s 3–8, 10