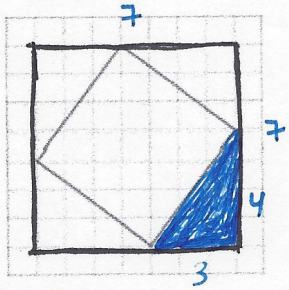
Section 1.3 – Measuring Line Segments

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

For example:



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? $A = \frac{b \times h}{2} = \frac{3 \times 4}{2} = 6$

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

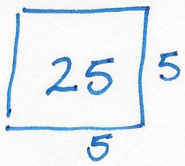
A square inside = A large square − 4 triangles

$49 - 24 = \boxed{25}$

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 $\boxed{5}$.



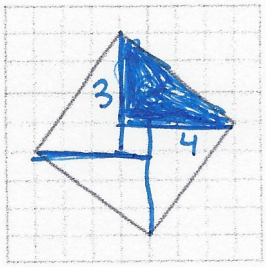
$A = 25$ means side length $= 5$

$A = 5 \times 5$ ($5 \to b$, $5 \to h$)

We can also simply use _____.

See below:

Area = 4 equal triangles + 1 small inside square



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

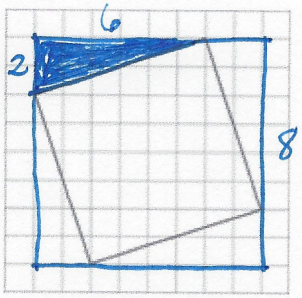
4 triangles = $4 \times 6 = \boxed{24}$

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

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

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

a)



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

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

• Area of 4 triangles

$6 \times 4 = 24$

• Area of bigger square

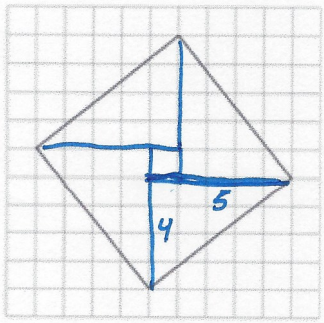
Area $\square$ $b \times h = 8 \times 8 = 64$

• Area of inside square

Area of Square − Area of 4 triangles

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

b)



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

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

• Area of inside square

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