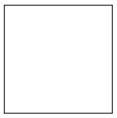
Square Root

1. Find the area of a square with side 15.



2. Find the areas for all the squares with sides 1 through 14:

(1) : _____ (6) : _____ (11) : _____

(2) : _____ (7) : _____ (12) : _____

(3) : _____ (8) : _____ (13) : _____

(4) : _____ (9) : _____ (14) : _____

(5) : _____ (10) : _____

3. (a) Find the length of the side of a square with area 121:

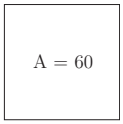
side = _____

(b) Find the length of the side of a square with area 81:

side = _____

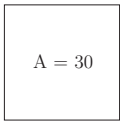
4. If the area of a square is 60 square units, the side of the square is between what two consecutive natural numbers?

_____ and _____



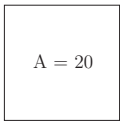
5. If the area of a square is 30 square units, the side of the square is between what two consecutive natural numbers?

_____ and _____



6. If the area of a square is 20 square units, the side of the square is between what two consecutive natural numbers?

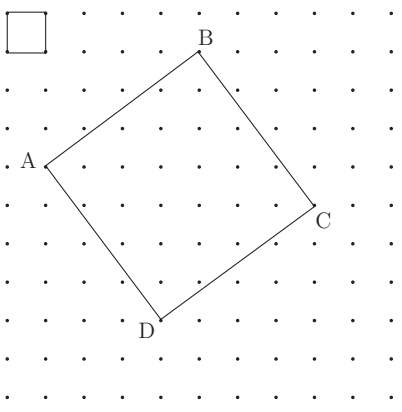
_____ and _____



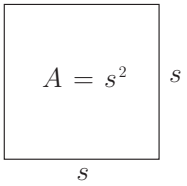
7. Use square units like the one shown at the top of the diagram to help you answer these questions.

(a) Find the area of the square, ABCD. _____

(b) How long is the side AB? _____



Squaring:
The area of a square, like the area of any rectangle, comes from the product of its height and width. The area of the square to the right is $A = s \times s$. We abbreviate this $A = s^2$ and say the area is given by s – "squared". Do you see where the name comes from?



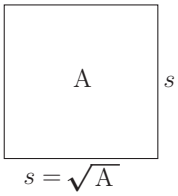
Square Root:
The reverse process also has a name.

If the area of a square is 100, the side is 10 because $10^2 = 10 \times 10 = 100$.

The length of the side is called the "square root" (written $\sqrt{\ }$) of the area.

For the example above the side of a square with area 100 is given by $s = \sqrt{100} = 10$.

In general we say $s = \sqrt{A}$.



Example: If the area of a square is 60, the side is $s = \sqrt{60}$. We know from # 4 that this number is between 7 and 8.

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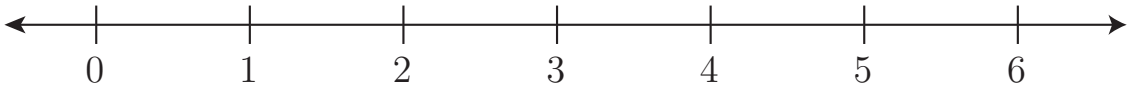
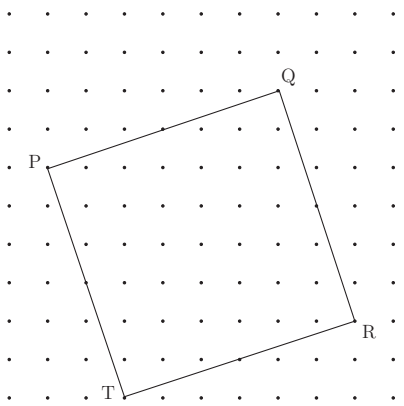
8. What is the length of the side of a square with area 90? _____

   What two natural numbers is this value between? _____ and _____

9. Show approximately where these numbers appear on the number line below. $\sqrt{2}, \sqrt{3}, \sqrt{5}, \sqrt{10}, \sqrt{19}, \sqrt{33}, \sqrt{40}$.



10. Use the figure to the right to answer these questions.



   (a) Find the area of the square, PQRT. _____

   (b) How long is the side RT? _____