

Square Roots

* Perfect Squares have an **Odd** number of factors.

Examples

1.
$$\begin{array}{c} 4 \\ \wedge \\ 1 \times 4 \\ 2 \times 2 \end{array}$$
 Factors of 4 are...
1, 2 & 4
 \therefore 4 is a perfect square
because it has 3 factors (odd)

2.
$$\begin{array}{c} 16 \\ \wedge \\ 1 \times 16 \\ 2 \times 8 \\ 4 \times 4 \end{array}$$
 Factors are...
1, 2, 4, 8, 16
 \therefore 16 is a perfect square
because it has 5 factors (odd #)

3.
$$\begin{array}{c} 36 \\ \wedge \\ 1 \times 36 \\ 2 \times 18 \\ 3 \times 12 \\ 4 \times 9 \\ 6 \times 6 \end{array}$$
 Factors are...
1, 2, 3, 4, 6, 9, 12, 18, 36
 \therefore 36 is a perfect square
because it has 9 factors (odd #)

** Write factors in ascending order
(lowest to highest) - starting with # 1

** In the ordered list of factors the
middle number is called the square
root!

So...36 had factors of...

1, 2, 3, 4, 6, 9, 12, 18, 36

Middle #

9 factors (odd #)
 \therefore perfect square, 6 is the middle #
 \therefore 6 is the $\sqrt{36}$

Any number with an even number of factors is not a
perfect square!!

Worksheet # 8

Text Book - page
15 - #'s 5, 6, 7, 8,
11, 13, 14, 15, 16,
19

$$\begin{array}{c} 32 \\ \wedge \\ 1 \times 32 \\ 2 \times 16 \\ 4 \times 8 \end{array}$$
 Factors of 32...
1, 2, 4, 8, 16, 32 (6 factors)
Even # of factors
 \therefore 32 is not a perfect square

