

A2 How to find the Approx Square Roots of

Note Title NON-Perfect Squares

25/09/2013

Perfect Square numbers that are broken down into 2 identical factors.

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|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|-------|-------|-------|-------|
| Perfect Squares | 1 | 4 | 9 | 16 | 25 | 36 | 49 | 64 | 81 | 100 | 121 | 144 | 169 | 196 | 225 |
| Factors | 1x1 | 2x2 | 3x3 | 4x4 | 5x5 | 6x6 | 7x7 | 8x8 | 9x9 | 10x10 | 11x11 | 12x12 | 13x13 | 14x14 | 15x15 |
| Square Root of Perf. Square | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |

$\sqrt{1}$
 $\sqrt{4}$
 $\sqrt{9}$
 $\sqrt{16}$
 $\sqrt{25}$
 $\sqrt{36}$
 $\sqrt{49}$
 $\sqrt{64}$
 $\sqrt{81}$
 $\sqrt{100}$
 $\sqrt{121}$
 $\sqrt{144}$
 $\sqrt{169}$
 $\sqrt{196}$
 $\sqrt{225}$

To find the square roots of NON-Perfect Squares, you:

- locate the perfect square Lower & higher than your number
- Identify the square roots of the perfect squares
- Estimate your number square root to ONE decimal place. (The 1st number is lowest factor).
- Check your answer to SIX decimals in a calculator.

Examples:

1. Find the approx. square roots of:

a) $\sqrt{12}$

$\sqrt{9} = \sqrt{3 \times 3} = 3$
 $\sqrt{16} = \sqrt{4 \times 4} = 4$
 $3.1 \rightarrow 3.9$
3.4

b) $\sqrt{80}$

$\sqrt{64} = \sqrt{8 \times 8} = 8$
 $\sqrt{81} = \sqrt{9 \times 9} = 9$
 $8.1 \rightarrow 8.9$
8.9

c) $\sqrt{104}$

$\sqrt{100} = \sqrt{10 \times 10} = 10$
 $\sqrt{121} = \sqrt{11 \times 11} = 11$
 $10.1 \rightarrow 10.9$
10.1

check $\sqrt{12} = 3.4641016$
 $\sqrt{12} = 3.464102$

check $\sqrt{80} = 8.9442719$
 $\sqrt{80} = 8.944272$

check $\sqrt{104} = 10.1980390$
 $\sqrt{104} = 10.198039$

2. Find a number that has a square root between:

a) 4 and 5 $= \sqrt{20}$

$4 \times 4 = 16$
 $5 \times 5 = 25$

any # b/w $\sqrt{17} \rightarrow \sqrt{24}$
 check $\sqrt{20} = 4.472$

b) 6 and 7 $= \sqrt{41}$

$6 \times 6 = 36$
 $7 \times 7 = 49$

any # b/w $\sqrt{37} \rightarrow \sqrt{48}$
 check $\sqrt{41} = 6.4031$