July 7, 2015

$0.3\overline{18}$ (From Yesterday)

Let $x = 0.31818\ldots$

$100x = 100(0.31818\ldots)$

$100x = 31.81818\ldots$

$-\ x = 0.31818\ldots$

$99x = 31.5$ * Note: Still a decimal!

$\frac{990x}{990} = \frac{315}{990}$

$x = \frac{315}{990} = \frac{63}{198} = \boxed{\frac{7}{22}}$

Jul 7-11:03 AM

6.3

#74 $0.\overline{384615}$

Let $x = 0.\overline{384615}$

more six places

$1{,}000{,}000x = 1{,}000{,}000(0.\overline{384615})$

$1000000x = 384615.\overline{384615}$

$-\ x = 0.\overline{384615}$

$\frac{999999x}{999999} = \frac{384615}{999999}$

$x = \frac{42{,}735}{111{,}111} = \frac{14245}{37037}$

Jul 7-11:10 AM

Real Numbers

Real

Rational, Irrational

$\pi, e, \sqrt{2}, \sqrt{3}, \sqrt{5}, \ldots$ Radicals

Irrational Numbers

- numbers which are not Rational

Pythagorean Theorem

$c^2 = a^2 + b^2$ * Solves Right-Angle Triangles

Side c: Hypotenuse (longest side)

Side b

Side a

90°

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Example

Triples: 3, 4, 5

① $c = 5'$, $b = 4'$, $a = 3'$, 90°

$c^2 = a^2 + b^2$

$c^2 = (3)^2 + (4)^2$

$c^2 = 9 + 16$

$\sqrt{c^2} = \sqrt{25}$

$c = 5$

Jul 7-11:30 AM

Nile River

Land

Land

Jul 7-11:38 AM

Example

② ?, $b = 1$, $a = 1$

$c^2 = (1)^2 + (1)^2$

$= 1 + 1$

$\sqrt{c^2} = \sqrt{2}$

$c = \sqrt{2}$?? * not a Rational Number!

Irrational

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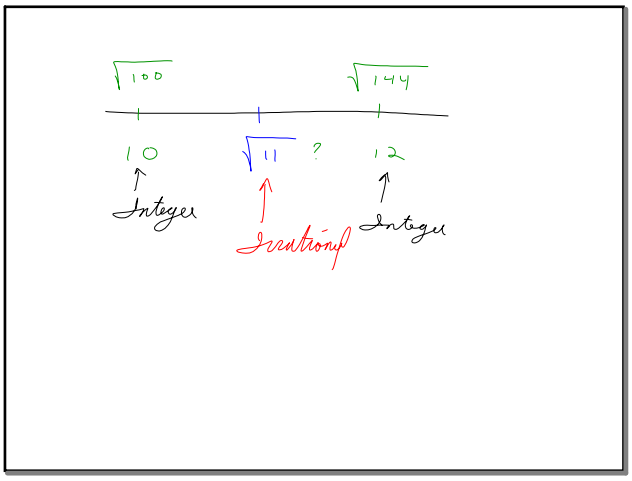

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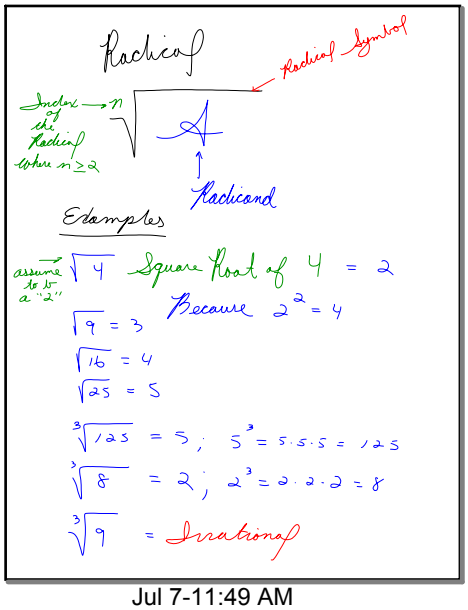

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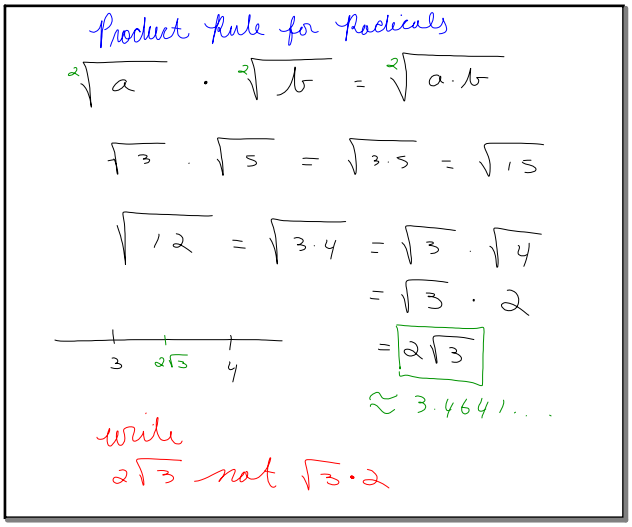

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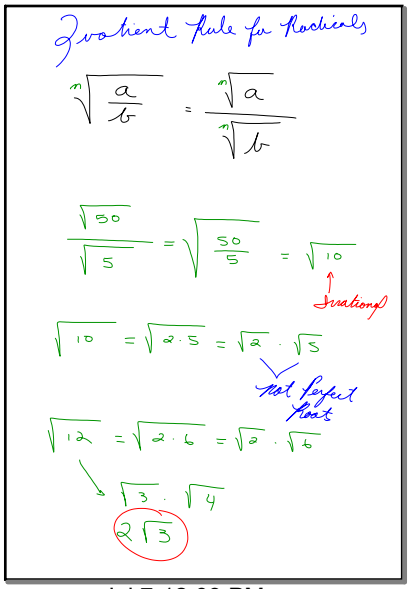

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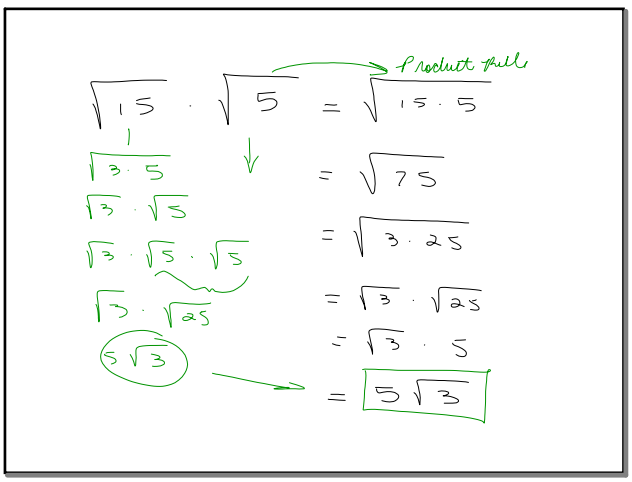

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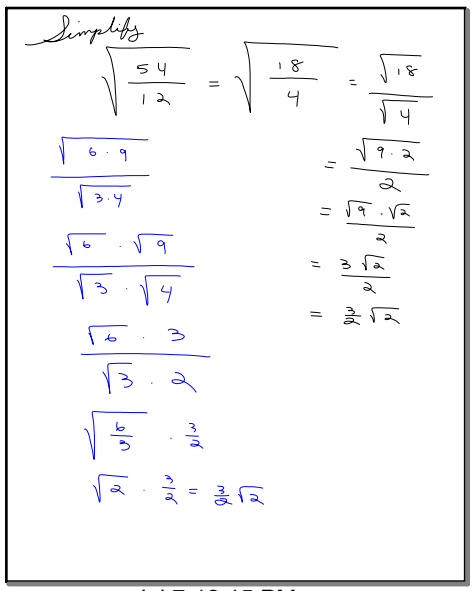

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