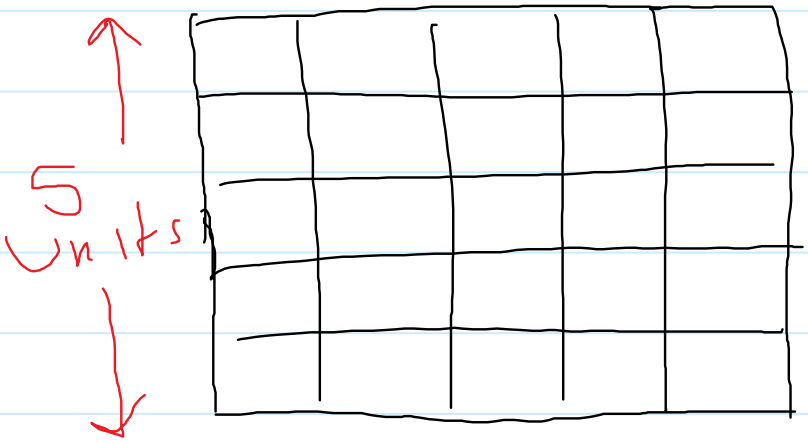
# 1.1 Square Roots of Perfect Squares

February 11, 2015

## Side Lengths and Areas of Squares

- the area is the square of the side length




$\text{Area} = \text{length}^2$
$= 5^2$
$= 25$

- the side length is the square root of the area

$\text{length} = \sqrt{\text{Area}}$
$= \sqrt{25}$
$= \sqrt{5 \times 5}$
$= 5$

## Whole Number Squares and Square Roots

- the square of a # is the multiplied by itself

-

$$5^2 = 5 \times 5$$

base exponent

- A square root of a # is one of 2 equal factors of a #

$$\sqrt{25} = \sqrt{5 \times 5}$$
$$= 5$$

## Perfect Squares

- a product of 2 equal factor

25 is a perfect square
$25 = 5 \times 5$

24 is a non-perfect square

- The square of a fraction or decimal is the # multiplied by itself

ex 1

$$\left(\frac{2}{3}\right)^2 = \frac{2}{3} \times \frac{2}{3} = \frac{2 \times 2}{3 \times 3} = \frac{4}{9}$$

Ex 2

$$(1.5)^2 = 1.5 \times 1.5 = 2.25$$

Is each fraction a perfect square?

a) $\frac{16}{25} = \frac{4 \times 4}{5 \times 5} = \sqrt{\frac{16}{25}} = \frac{4}{5}$

b.) $\frac{9}{20} = \frac{3 \times 3}{?}$ not a perfect square

- a terminating decimal ends after a certain # of decimal places
- a repeating decimal has a repeating pattern of digits.

terminating 0.5 0.28

repeating 0.33333... $0.\overline{3}$

0.191919... $0.\overline{19}$

Non-terminating and non Repeating

0.41421356... 1.0710678 12...

* the square root of a perfect square decimal is either a terminating decimal or a repeating decimal

Ex 1

(a.) 1.69 $\sqrt{1.69} = 1.3$ ✓ perfect square

(b.) 3.5 $\sqrt{3.5} = 1.870828693$ ✗ not a perfect

pg 11 # 3-5, 7-11, 13