Curriculum Outcome

(N5) Determine the square root of positive rational numbers that are perfect squares.

(N6) Determine an approximate square root of positive rational numbers that are non-perfect squares.

(SS2) Determine the surface area of composite 3-D objects to solve problems

(N4) **Explain and apply the order of operations, including exponents, with and without technology.**

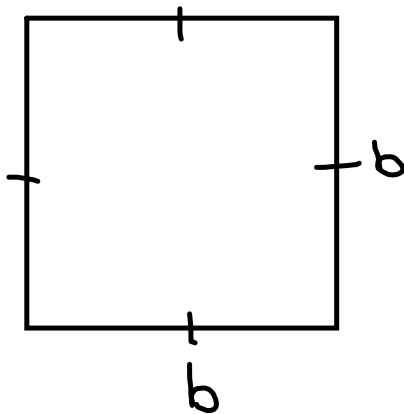## 1.1 Square Roots of Perfect Squares

A new parking lot is a square with an area of 900 m^2. What is the side length of the square?

Think Area of a Sqaure

Area = base x height
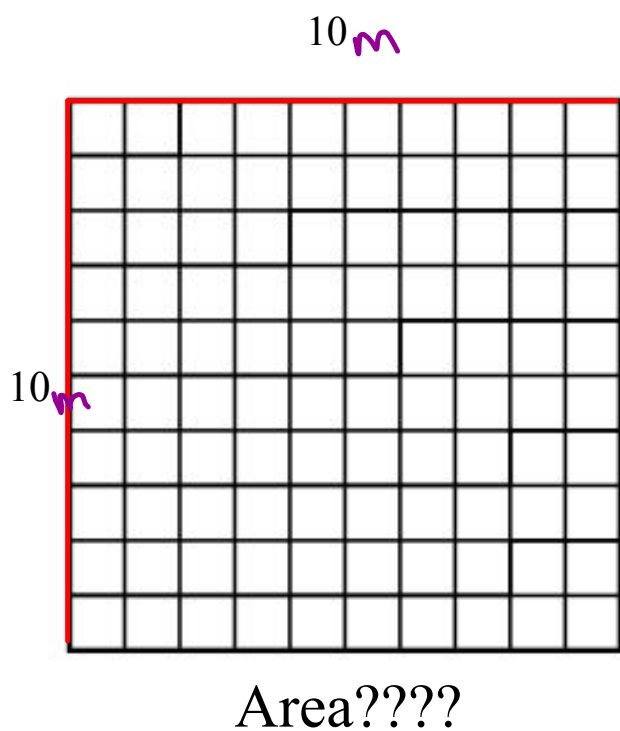
"Square" THEN...
Base = Height

$$A = b \times b$$

$$A = b^2$$

$$\sqrt{900} = \sqrt{b^2}$$
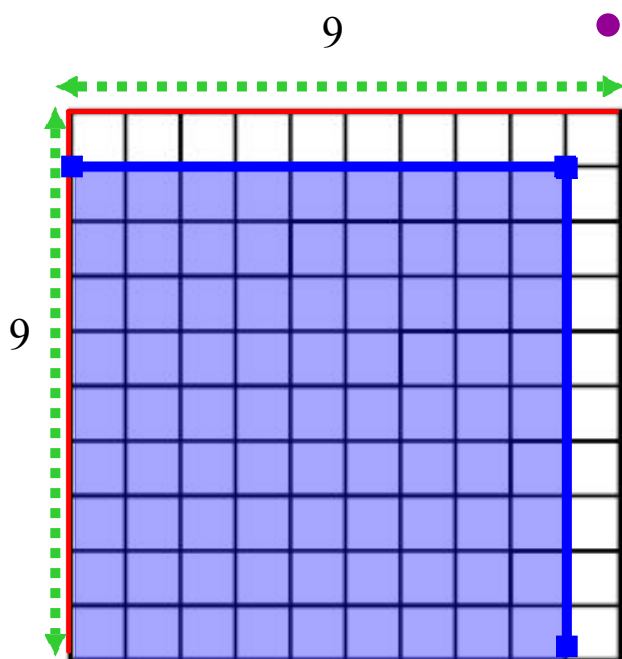
$$30 = b$$

10 m

10 m

Area????

$A = b \times h$

$A = 10 \times 10$

$A = 10^2$

$A = 100 \, m^2$

$10 \, m \times 10 \, m$

$10^2 \, m^2$

$100 \, m^2$

9

This sqaure is divided into 100 equal parts.
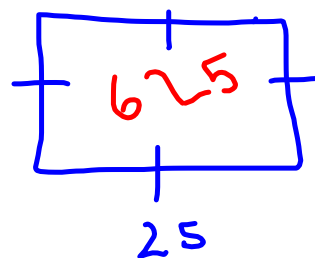
What is the area of the blue square?

Area of square

The Area of a square is 625 m^2, what is the length of the side?
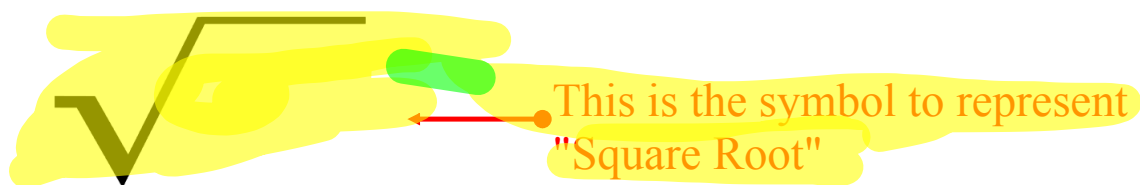
$$A = b^2$$

$$\sqrt{625} = \sqrt{b^2}$$

$$\boxed{25 = b}$$

625

25

Area of a Square	Side length as a Sqaure Root
9	3
16	4
289	17
49	7
169	13
100	10
___	___

To determine the side length of a square we, calculate the "square root" of its area

$$\sqrt{}$$

This is the symbol to represent "Square Root"

Square Root is the opposite to Squaring a number

Area of a square = (length of the side)^2

Perfect Squares

$(1)^2 = $ **1**

$(2)^2 = $ **4**

$(3)^2 = $ **9**

$(4)^2 = 4 \times 4 = $ **16**

$(5)^2 = 5 \times 5 = $ **25**

$(6)^2 = 6 \times 6 = $ **36**

$(7)^2 = 7 \times 7 = $ **49**

$(8)^2 = 8 \times 8 = $ **64**

$(9)^2 = 9 \times 9 = $ **81**

$(10)^2 = 10 \times 10 = $ **100**

$(11)^2 = 11 \times 11 = $ **121**

$(12)^2 = 12 \times 12 = $ **144**

$(13)^2 = 13 \times 13 = $ **169**

$(14)^2 = 14 \times 14 = $ **196**

$(15)^2 = 15 \times 15 = $ **225**

$(16)^2 = 16 \times 16 = $ **256**

$(17)^2 = 17 \times 17 = $ **289**

$(18)^2 = 18 \times 18 = $ **324**

$(19)^2 = 19 \times 19 = $ **361**

$(20)^2 = 20 \times 20 = $ **400**

$(21)^2 = 21 \times 21 = $ **441**

$(22)^2 = 22 \times 22 = $ **484**

$(23)^2 = 23 \times 23 = $ **529**

$(24)^2 = 24 \times 24 = $ **576**

$(25)^2 = 25 \times 25 = $ **625**

What is the area?

Square — side $\frac{11}{10}$ (left) and $\frac{11}{10}$ (bottom)
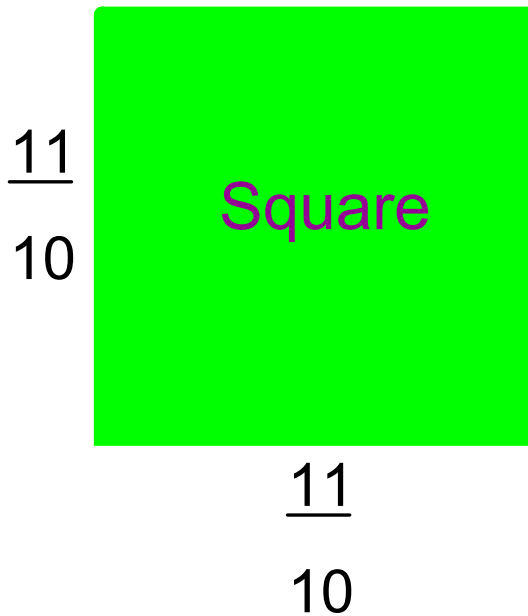
$A = b^2$

$A = \left(\frac{11}{10}\right)^2$

$A = \frac{121}{100}$

What is the perimeter?

$P = 4 \times side$

$P = \frac{4}{1} \times \frac{11}{10}$

$P = \frac{44}{10}$

Area of square = $\dfrac{49}{81}$ cm^2

What is the length of the sides?

$$\sqrt{\dfrac{49}{81} \text{ cm}^2}$$

$$= \dfrac{7}{9} \text{ cm}^1$$
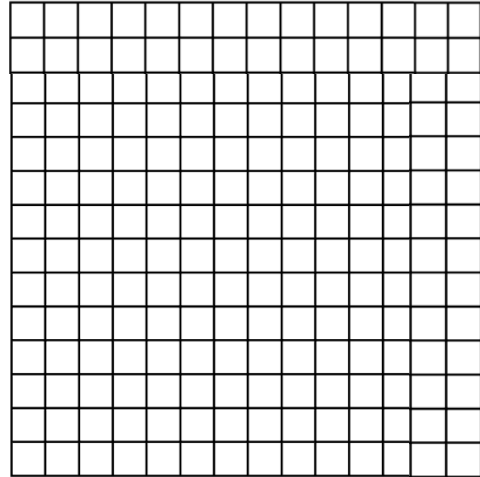
What it the perimeter of the square

$$P = \dfrac{7}{9} + \dfrac{7}{9} + \dfrac{7}{9} + \dfrac{7}{9}$$

$$P = \dfrac{28}{9}$$

Area of a square is $\dfrac{196}{100}$

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Then the length of a side is determined by taking the square root of the its area.   ***

$$A = b \times h$$

Side Length $= \sqrt{\dfrac{196}{100}}$

$= \sqrt{\dfrac{14 \times 14}{10 \times 10}}$

$= \dfrac{14}{10}$

The side lengthe is $\dfrac{14}{10}$ units

How do we know if a number is a perfect Square using a calculator?

→ When you take the square root
        The answer has to have a   Decimal terminates

$$\sqrt{1.25}$$
$$= 1.1180 3398...\bullet$$
$$\text{Not P.S}$$

$$\sqrt{0.81}$$
$$= 0.9$$
$$\text{P.S}$$

Without Calculator

Example:
Determine if the decimal is a perfect square?

a) 0.25

$$= \sqrt{\frac{25}{100}}$$

$$= \frac{5}{10}$$

0.25 is P.S

b) 2.5

$$= \sqrt{\frac{25}{10}}$$

$$= \frac{5}{?}$$

2.5 is Not P.S

c) 1.69

$$\sqrt{\frac{169}{100}}$$

$$= \frac{13}{10}$$

1.69 is P.S

10^1 $10 = $ Not 0.0169

10^2 $100 = $ Yes $\dfrac{169}{10000}$

10^3 $1000 = $ No

10^4 $10\,000 = $ Yes

          $10\ 10\ 10\ 10$

Class/Homework

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3 (a, b, c)

#5 (without calculator)

7 (without calculator)