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.**

Bonus: Simplify

$$\left[\frac{[(x^5)^2\cdot(y^2)^4]^3\cdot[(x\cdot y^3)^4]^2}{[(x^4\cdot y^3)^2]^3\cdot[(x^2)^0\cdot(y^3)^4]^2}\right]^2$$

Top

$[(x^5)^2\cdot(y^2)^4]^3\cdot[(x\cdot y^3)^4]^2$

$[x^{10}\ y^8]^3\cdot[x^4\ y^{12}]^2$

$[x^{30}\ y^{24}]\cdot[x^8\ y^{24}]$

$[x^{38}\ y^{48}]$

Bottom

$[(x^4\cdot y^3)^2]^3\cdot[(x^2)^0\cdot(y^3)^4]^2$

$[x^8 y^6]^3\cdot[x^0\ y^{12}]^2$

$[x^{24}\ y^{18}]\cdot[x^0\ y^{24}]$

$[x^{24}\ y^{42}]$

$$\left[\frac{\text{Top}}{\text{Bottom}}\right]^2 = \left[\frac{x^{38}\ y^{48}}{x^{24}\ y^{42}}\right]^2$$

$$[x^{14}\ y^6]^2$$

$$= x^{28}\ y^{12}$$

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

Write the area as a product

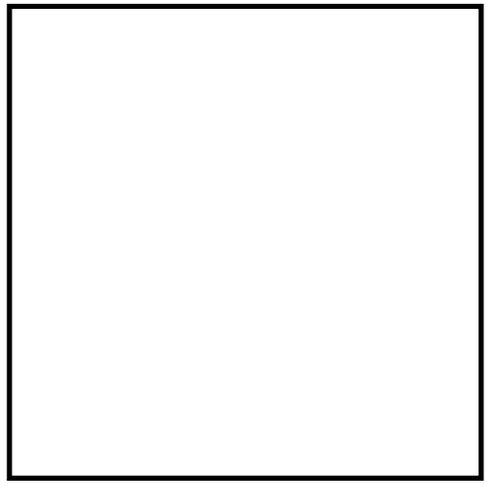
"Square" THEN...
Base = Height

Area = base x height

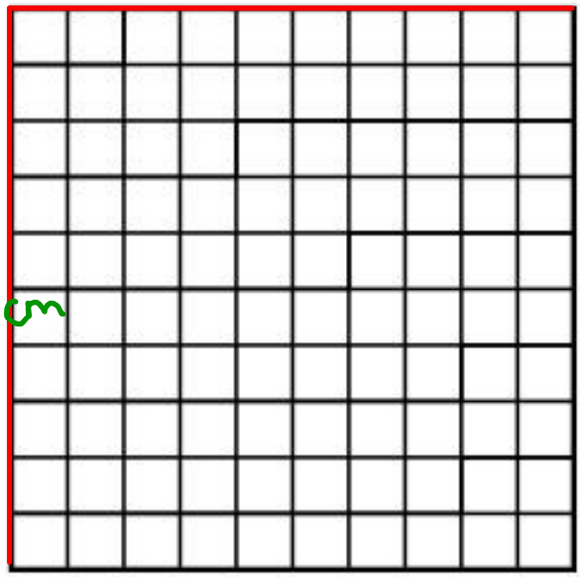
$900 = b \times b$

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

$b = 30$



10 cm



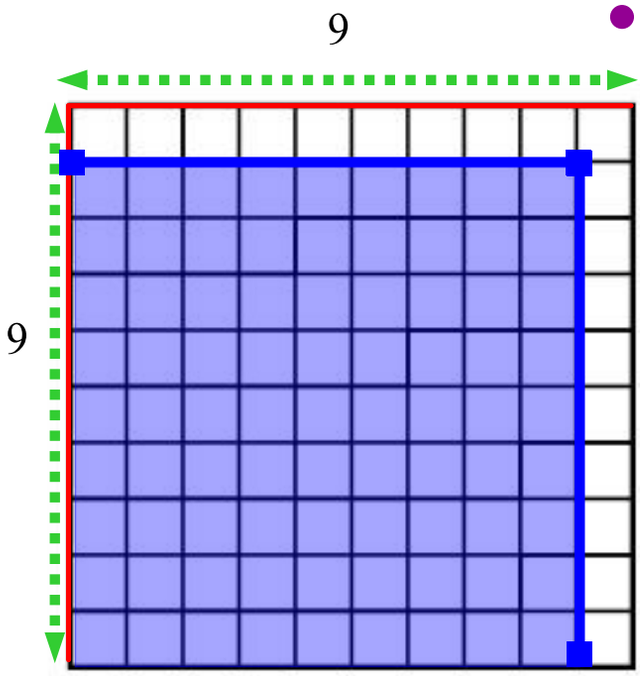
10 cm

Area????

$A = b \times h$

$A = 10_{cm} \times 10_{cm}$

$A = 100\ cm^2$

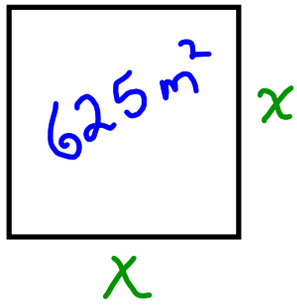


This sqaure is divided into 100 equal parts.

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?

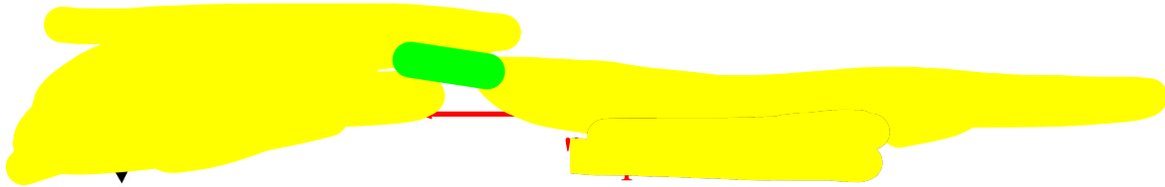


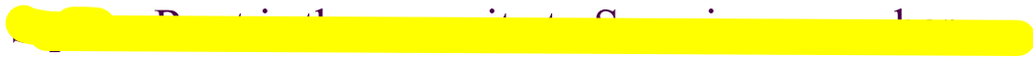
$x = \sqrt{625}$

$x = 25$

Area of a Square	Side length as a Sqaure Root
9	3
16	4
36	6
49	7
169	13
100	10

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





Perfect Squares

$(1)^2 = 1 \times 1 = \mathbf{1}$

$(2)^2 = 2 \times 2 = \mathbf{4}$

$(3)^2 = 3 \times 3 = \mathbf{9}$

$(4)^2 = 4 \times 4 = \mathbf{16}$

$(5)^2 = 5 \times 5 = \mathbf{25}$

$(6)^2 = 6 \times 6 = \mathbf{36}$

$(7)^2 = 7 \times 7 = \mathbf{49}$

$(8)^2 = 8 \times 8 = \mathbf{64}$

$(9)^2 = 9 \times 9 = \mathbf{81}$

$(10)^2 = 10 \times 10 = \mathbf{100}$

$(11)^2 = 11 \times 11 = \mathbf{121}$

$(12)^2 = 12 \times 12 = \mathbf{144}$

$(13)^2 = 13 \times 13 = \mathbf{169}$

$(14)^2 = 14 \times 14 = \mathbf{196}$

$(15)^2 = 15 \times 15 = \mathbf{225}$

$(16)^2 = 16 \times 16 = \mathbf{256}$

$(17)^2 = 17 \times 17 = \mathbf{289}$

$(18)^2 = 18 \times 18 = \mathbf{324}$

$(19)^2 = 19 \times 19 = \mathbf{361}$

$(20)^2 = 20 \times 20 = \mathbf{400}$

$(21)^2 = 21 \times 21 = \mathbf{441}$

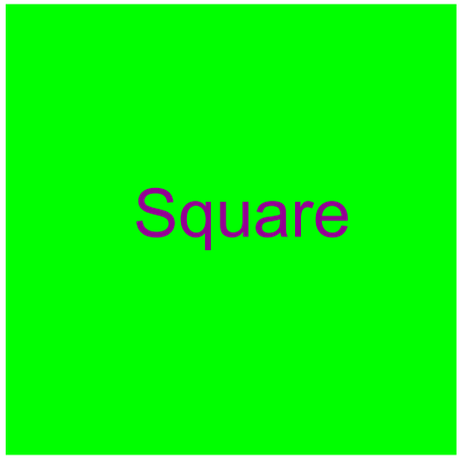
$(22)^2 = 22 \times 22 = \mathbf{484}$

$(23)^2 = 23 \times 23 = \mathbf{529}$

$(24)^2 = 24 \times 24 = \mathbf{576}$

$(25)^2 = 25 \times 25 = \mathbf{625}$

What is the area of the following



$\frac{11}{10}$

$\frac{11}{10}$

What is the area?

$A = b^2$

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

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

What is the perimeter?

$P =$ side + side + side + side

$P = \frac{11}{10} + \frac{11}{10} + \frac{11}{10} + \frac{11}{10}$

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

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

What is the length of the sides?

$= \frac{7}{9}$

What it the perimeter of the square

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

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

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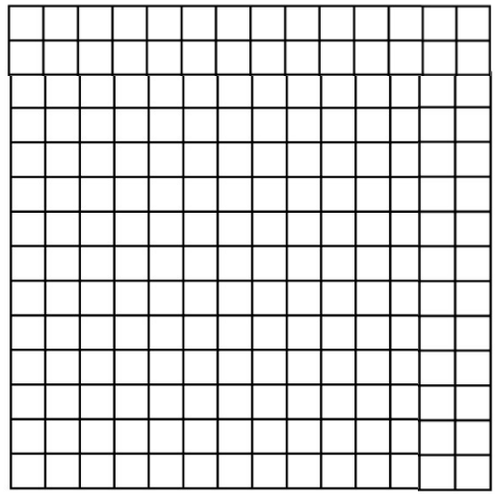
Then the length of a side is determined by taking the square root of the its area. ***

$A = b \times h$



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

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

$= \frac{14}{10}$

The side lengthe is $\frac{14}{10}$ 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

a) Decimal terminates

$\sqrt{1.25}$

$= 1.11803\ldots$

Not P.S

$\sqrt{0.81}$

$= 0.9$

Yes

P.S

Without Calculator

Example:

Determine if the decimal is a perfect square?

a) 0.25

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

$= \frac{5}{10}$

Yes P.S

b) 2.5

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

$= \frac{5}{?}$

Not P.S

c) 1.69

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

$= \frac{13}{10}$

Yes P.S

Class/Homework

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3 (a, b, c)

#5 (without calculator)

7 (without calculator)