

Squares & Square Roots

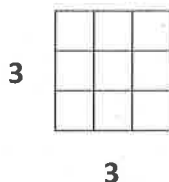
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- ✚ The **ROOT** of a square is the length of the side of the square. In other words, the base of your exponent is the root of the square!

$$3^2 = 9 \therefore \sqrt{9} = 3$$



✚ Square Root Rules:

- Any square root can be broken down into its parts (FACTORED) to determine if it is a perfect square root, as well as finding its root, without using a calculator

- $\sqrt{axb} = \sqrt{a} \times \sqrt{b}$
- E.G. $\sqrt{36} = \sqrt{9 \times 4} = \sqrt{9} \times \sqrt{4} = 3 \times 2 = 6$

- Fractions within a square root can be dealt with (reduced, etc.) before you deal with the square root sign.

- $\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$
- E.G. $\sqrt{\frac{8}{18}} = \sqrt{\frac{4}{9}} = \frac{\sqrt{4}}{\sqrt{9}} = \frac{2}{3}$

- ✚ The square root symbol is the opposite of a squared exponent; just as a cube root is the opposite of a cubed symbol.

- These functions reverse each other's processes just as multiplication/division and adding/subtracting do. Thus, to find an unknown you treat it like an algebra question:

- **Use opposite functions to isolate the variable.**
- **To keep the equation balanced you must do any action to both sides of the equals.**

- $\sqrt{x^2} = x$ The square and square root symbol cancel each other out!

- $169 = x^2$
- $\sqrt{169} = \sqrt{x^2}$
- $\sqrt{169} = x$
- $13 = x$

←To find the value of x you must use opposite functions to isolate the variable. Make sure you do the same function to both sides of the equation!

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Write out the square as two equal factors and solve.

1) 0^2
= 0×0
= 0

2) 1^2

3) 2^2

4) 3^2

5) 5^2

6) 7^2

7) 13^2

8) 14^2

9) 15^2

Find the square root.

10) $0 =$

11) $1 =$

12) $4 =$

13) $9 =$

14) $25 =$

15) $49 =$

16) $169 =$

17) $196 =$

18) $225 =$

Solve using the square root properties. $\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$

19) $\sqrt{\frac{4}{9}}$

20) $\sqrt{\frac{1}{4}}$

21) $\sqrt{\frac{4}{16}}$

$$22) \sqrt{\frac{24}{54}}$$

$$23) \sqrt{\frac{3}{48}}$$

$$24) \sqrt{\frac{27}{243}}$$

Solve for x.

$$25) \sqrt{x^2} = \sqrt{9}$$

$$26) \sqrt{x} = \sqrt{9}$$

$$27) \sqrt{x} = 15$$

$$28) \sqrt{x^2} = 4$$

$$29) \sqrt{x} = 3^2$$

$$30) \sqrt{x} = \sqrt{6}$$

$$31) \sqrt{x^2} = \sqrt{7^2}$$

$$32) \sqrt{x} = 8$$

$$33) \sqrt{x^2} = 6$$

Solve.

34) If the area of a square is 144cm^2 , what is the perimeter of the square?

35) The length of a rectangle is twice as long as its width. If the area is 162mm^2 what is the perimeter?

36) A square gym floor is made up of square tiles that are 900cm^2 . If the gym has 22,500 tiles, what is the area of the gym floor in m^2 ? (UNITS!)

- 37) A rectangular solid with a square base has a height of 4cm and a volume of 576cm^3 . (Volume= Area of Base x Height) What are the dimensions of the rectangular solid?
- 38) Square A has an area four times that of Square B. If the area of the two squares together is 80cm^2 , what is the length of the side of the larger square
- 39) Electromagnetic force, E in volts, is determined by the formula: $E = \sqrt{W * R}$, where W is watts and R is resistance in ohms. How many watts are needed to produce an electromagnetic force of 20 volts if the resistance is 5 ohms?
- 40) A formula that gives the relationship between current, I in amps, Power, P in watts, and resistance, R in ohms, is $I = \sqrt{\frac{P}{R}}$. If the resistance is 5 ohms, and the current is 10 amps, what is the power in watts?