

Roots of positive numbers



1 Calculate the squares.

a) $4^2 = 16$ $(-4)^2 = 16$ $-4^2 = -16$

b) $7^2 = 49$ $-7^2 = -49$ $(-7)^2 = 49$

c) $0^2 = 0$

2 Write the numbers in the correct place in the sorting table.

- 71 2 4 -8 -81 10
- 49 -16 200 -50 -25 169

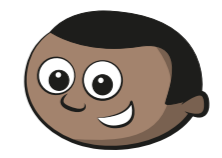
	Square number	Not a square number
Positive number	4 49 169	71 2 10 200
Negative number		-8 -81 -16 -50 -25

What do you notice?

E.g. There are no negative square numbers.

3 Mo is finding the square root of 64

To find the square root of a number you divide by 2. The answer can be positive or negative.



Here is his working out.

$$64 \div 2 = 32$$

$$\sqrt{64} = 32$$

Is Mo correct? No

Explain your answer.

Calculating the square root of a number isn't the same as dividing by 2. $\sqrt{64} = 8$

4 We know that $6^2 = 36$ and $(-6)^2 = 36$

So we also know that if $x^2 = 36$ then $x = 6$ and $x = -6$

Solve the equations.

a) $x^2 = 25$ $x = 5$ and $x = -5$

b) $x^2 = 1$ $x = 1$ and $x = -1$

c) $x^2 = 121$ $x = 11$ and $x = -11$

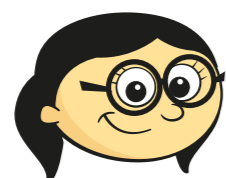
d) $x^2 = 4$ $x = 2$ and $x = -2$

e) $x^2 = 9,000,000$ $x = 3,000$ and $x = -3,000$

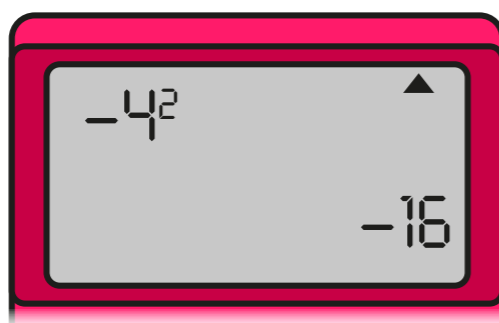
- 5 Use a calculator to help you solve $y^2 = 75$

$$y = \boxed{8.66} \text{ and } y = \boxed{-8.66}$$

- 6 Annie thinks that -16 is a square number.



When I put -4^2 into my calculator it comes out -16



Annie has made a mistake.

- a) Explain why -16 is not the square of -4

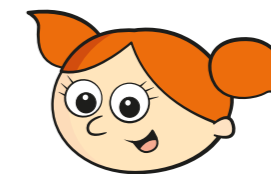
$-4 \times -4 = 16$ not -16

- b) What mistake has Annie made?

She should have put brackets around the -4
so $(-4)^2$ not -4^2

- 7

If you square root a number, the answer is always smaller.



Use an example to show Alex is incorrect.

e.g. $\sqrt{\frac{1}{4}} = \frac{1}{2}$ and $\frac{1}{2} > \frac{1}{4}$

- 8 Brett thinks of a number.
He squares the number and subtracts 26
Brett's answer is 199

- a) What was Brett's original number?

$\boxed{15}$

- b) Is there more than one possible answer?

He could have been thinking of -15

- 9 Dora is thinking of two numbers.
She squares the numbers, then adds them together.
The answer is equal to another square number.
What two numbers was Dora thinking of?

e.g. $\boxed{3}$ and $\boxed{4}$

How many possible answers can you find?