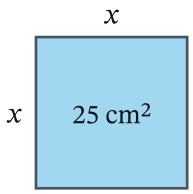
Name _____ Date _____

The Equation $x^2 = a$

Example



Which numbers multiplied by themselves give 25? They are 5 and −5: $5 \times 5 = 25$ and $(-5) \times (-5) = 25$.

The equation $x^2 = 25$ has two solutions: $x_1 = 5, x_2 = -5$. In short, $x = \pm 5$.

The side of a square with area 25 cm² is only 5 cm, because a length is not negative.

Remember

The equation $x^2 = a$: for $a > 0$ it has **two solutions** $x = \pm \sqrt{a}$, for $a = 0$ **one** solution $x = 0$, and for $a < 0$ it has **no real solutions**, because the square of a real number is never negative.

1 ON YOUR OWN Solve. If an equation has no real solutions, say so.

$x^2 = 16$ ☐ $x^2 = 81$ ☐

$x^2 = 1$ ☐ $x^2 = 0$ ☐

$x^2 = -9$ ☐ $x^2 = 7$ ☐

$x^2 = \frac{1}{4}$ ☐ $x^2 = 0.36$ ☐

2 ON YOUR OWN First get x^2 on its own, then solve.

$3x^2 = 48$ ☐ $x^2 - 49 = 0$ ☐

$2x^2 + 8 = 0$ ☐ $5x^2 - 20 = 0$ ☐

$\frac{x^2}{2} = 18$ ☐ $4x^2 = 9$ ☐

Names (pair) _____ Date _____

Example

If $(x-3)^2=16$, then $x-3=4$ or $x-3=-4$, so $x_1=7$, $x_2=-1$.

3 IN PAIRS Solve in the same way.

$(x+1)^2=9$ ☐ $(x-5)^2=0$ ☐

$(2x-1)^2=25$ ☐ $(x+4)^2=-1$ ☐

4 IN PAIRS True or false? Explain.

$\sqrt{36}=\pm 6$ **true** / **false**

Why? _____

The equation $x^2=36$ has the solutions 6 and -6. **true** / **false**

Why? _____

$(-6)^2=-36$ **true** / **false**

Why? _____

The equation $x^2+36=0$ has no real solutions. **true** / **false**

Why? _____

5 ON YOUR OWN A stone falls from a bridge. In t seconds it falls $5t^2$ metres. How many seconds does it take to fall 80 m?

★ ON YOUR OWN **Exit card.** Solve: $x^2=64, x^2+9=0, (x-2)^2=9$.