Square & Cube Roots

Square Roots :

- Positive numbers have two square roots because, both the product of two negatives and two positives is positive.
- For example, $\sqrt{36}$ = 6 and -6.
- Negative numbers have no real square roots because, they have imaginary roots, but no real ones.

Perfect Squares :

$1^2 = 1 \cdot 1 = 1$	$5^2 = 5 \cdot 5 = 25$
$2^2 = 2 \cdot 2 = 4$	$6^2 = 6 \cdot 6 = 36$
$3^2 = 3 \cdot 3 = 9$	$7^2 = 7 \cdot 7 = 49$
$4^2 = 4 \cdot 4 = 16$	$8^2 = 8 \cdot 8 = 64$

Cube Roots :

- Positive numbers have positive cube roots because, an odd number of identical factors produces a product of the same sign as the factors.
- Negative numbers have negative cube roots because, an odd number of identical factors produces a product of the same sign as the factors.

Perfect Cubes :

$1^3 = 1 \cdot 1 \cdot 1 = 1$	$5^3 = 5 \cdot 5 \cdot 5 = 125$
$2^3 = 2 \cdot 2 \cdot 2 = 8$	$6^3 = 6 \cdot 6 \cdot 6 = 216$
$3^3 = 3 \cdot 3 \cdot 3 \cdot = 27$	$7^3 = 7 \cdot 7 \cdot 7 = 343$
$4^3 = 4 \cdot 4 \cdot 4 = 64$	$8^3 = 8 \cdot 8 \cdot 8 = 512$

Simplifying Square Roots :

- Re-write the radicand as the product of the largest perfect square and another factor.
- Factor out the perfect square.
- Simplify.

$$\sqrt{150}$$
$$\sqrt{25 \cdot 6}$$
$$\sqrt{25} \cdot \sqrt{6}$$
$$5\sqrt{6}$$

Equations with Roots :

- The inverse of a square is a square root. The inverse of a cube is a cube root.
- Solve equations involving roots by using inverse operations, just as you would with addition, subtraction, etc.

$$x^2 = 25$$
$$\sqrt{x^2} = \sqrt{25}$$
$$x = 5$$