Name ______________________________ Date Answer Key

SOLVING EQUATIONS WITH SQUARE ROOTS

Taking the square root of a number is the opposite, or inverse, of squaring it. So, you can solve some equations using square roots.

Let's try it! Solve $x^2 = 9$.

$x^2 = 9$	
$\sqrt{x^2} = \sqrt{9}$	Take the square root of both sides of the equation.
$x = \pm 3$	Since $3^2 = 3 \cdot 3 = 9$ and $(-3)^2 = (-3) \cdot (-3) = 9$, both 3 and −3 are square roots of 9. You can write this as ±3.

In the example above, you can simplify the square root of 9 to get ±3 since 9 is a perfect square.

Consider solving an equation like $x^2 = 11$. Because 11 is not a perfect square, you would need to write your answer using the square root symbol. So, the exact solution of $x^2 = 11$ is $x = \pm\sqrt{11}$.

Try it yourself! Solve each equation for the variable. Don't forget to check if you're taking the square root of a perfect square or not!

$a^2 = 36$ $a = \pm 6$	$m^2 = 4$ $m = \pm 2$	$g^2 = 68$ $g = \pm\sqrt{68}$ (or $\pm 2\sqrt{17}$)
$j^2 = 16$ $j = \pm 4$	$q^2 = 20$ $q = \pm\sqrt{20}$ (or $\pm 2\sqrt{5}$)	$b^2 = 144$ $b = \pm 12$
$r^2 = 55$ $r = \pm\sqrt{55}$	$d^2 = 81$ $d = \pm 9$	$s^2 = 225$ $s = \pm 15$
$f^2 = 141$ $f = \pm\sqrt{141}$	$w^2 = 100$ $w = \pm 10$	$h^2 = 200$ $h = \pm\sqrt{200}$ (or $\pm 10\sqrt{2}$)
$c^2 = 289$ $c = \pm 17$	$y^2 = 400$ $y = \pm 20$	$z^2 = 180$ $z = \pm\sqrt{180}$ (or $\pm 6\sqrt{5}$)
$v^2 = 900$ $v = \pm 30$	$k^2 = 625$ $k = \pm 25$	$p^2 = 250$ $p = \pm\sqrt{250}$ (or $\pm 5\sqrt{10}$)