Math 060 WORKSHEET NAME:_____

9.1 Finding Roots

In this section we look at reversing the process of squaring and cubing a number. This is done by square roots and cube roots.

SQUARE ROOTS:

We can see that $3^2 = (-3)^2 = 9$, this is why we say that 3 and -3 are the square roots of 9.

In finding the square root of a given number we are looking for a number that we can square and get the given number.

EXAMPLE: Find the square roots of the following numbers

a.) 121 b.) $\frac{49}{64}$ c.) -16

RADICALS:

We are interested in the positive square root of any number. The symbol $\sqrt{\ }$, called a radical sign, denotes the positive square root.

i.e. $\sqrt{121} = 11$, $\sqrt{\frac{49}{64}} = \frac{7}{8}$

EXAMPLE:

1.) $\sqrt{81}$ 2.) $\sqrt{9} - \sqrt{4}$ 3.) $\sqrt{-25}$

4.) $\sqrt{0.64}$ 5.) $\sqrt{144 + 25}$ 6.) $\sqrt{\frac{9}{100}}$

EXAMPLE:

The velocity v (in feet per seconds) of an object dropped from a tall building after falling d feet is given by $v = \sqrt{64d}$. What is the velocity of an object that has fallen 100 feet?

HIGHER POWER ROOTS:

Finding the square root of a number reverses the process of squaring a number. In a similar way we can do this for higher powers.

$5^3 = 125 \Rightarrow \sqrt[3]{125}$ $(-2)^3 = -8 \Rightarrow \sqrt[3]{-8} = -2$ $2^4 = 16 \Rightarrow \sqrt[4]{16}$

Notice where you indicate a cube root or fourth root. This is called the **index** of the radical. The number under the radical is called the **radicand**.