Exponents, Roots, and Scientific Notation

This worksheet includes problems on simplifying exponents, roots, and converting values between scientific notation and decimal notation. Before starting you may wish to watch the Penrose GED Prep video on exponents, roots and scientific notation. Starred problems ($\star$) have video solutions.

Exponents

As you watch the video for this worksheet, you may want to write useful facts about exponents below, as they appear in the video.

- Any number to the first power equals:

- Any number to a negative exponent is:

- Any number to the zeroth power equals:

The following expressions include exponents. Calculate their values.

- $2^2 \cdot 2^4$

$\star$ $4 \cdot 4^1 \cdot 4^0$

- 1^7

$\star$ $(\frac{1}{-2})^2$

- $(-3)^3$

Roots

Write out the first five (or more if you like) perfect squares here:

The following expressions include roots. See if you can find a whole number with equal value to the root expression.

$\star$ $\sqrt{4}$

- $\sqrt{9}$

* ⋆ $\sqrt{11}$

* ⋆ $\sqrt[3]{27}$

* $\sqrt[3]{8}$

Scientific Notation

Scientific notation is a way of easily writing very big, and very small numbers as a product of two things. Describe these two things below:

The following expressions are written in decimal notation. Write them in scientific notation.

* ⋆ 20.3

* 49,000

* ⋆ 0.077

The following expressions are written in Scientific notation. Write them in decimal notation.

* $2.33 \cdot 10^4$

* $4 \cdot 10^{-2}$

For some additional clarification on how to solve problems that involving exponents, roots, and scientific notation, you can click on the links below

- Penrose GED Prep Video - Exponents
- Penrose GED Prep Video - Roots
- Penrose GED Prep Video - Scientific Notation
- Math is Fun - Exponents
- Math is Fun - Squares and Square Roots
- Math is Fun - Scientific Notation
- Khan Academy - Exponents
- Khan Academy - General Square Roots
- Khan Academy - General Square Roots