

Mixed Review from 7th grade

I. Absolute Value: Calc: **MATH** → **1: abs. (** works like ()
Do first in order of operations

A) Definition: The total distance the number is away from zero $|\pm x| = x$

B) Ex's 1) $|-6| = 6$ 2) $|-5| \cdot |3| = 5 \cdot 3 = 15$ 3) $-|-4| = -4$ 4) $-|-2| - |-3| = -2 - 3 = -5$

5) $|5 + -11| = |-6| = 6$ 6) $|5| + |-11| = 5 + 11 = 16$ 7) If $a * b = |a - b|$, what is the value of $6 * 8$?
 $a = 6, b = 8 \rightarrow 6 * 8 = |6 - 8| = |-2| = 2$
 $6 * 8 = 16 - 8 = 8$
 $5 * 7 = |5 - 7| = |-2| = 2$

II. Square Roots:

A) Definition: The square root of a number is a value that, when multiplied by itself, gives the number. Symbol: $\sqrt{\quad}$ Every positive number has two square roots, one positive and one negative. ex: $\sqrt{16} = -4$ and 4 or ± 4 . Principal Square root: The non-negative square root

Calc: **2nd** **x²**

$(4)^2 = 4 \cdot 4 = 16$
 $(-4)^2 = -4 \cdot -4 = 16$

B) Simplify:

1) $\sqrt{4} = 2$

2) $-\sqrt{9} = -3$ 3) $\pm\sqrt{100} = \pm 10$

4) $-\sqrt{\frac{9}{144}} = -\frac{\sqrt{9}}{\sqrt{144}} = -\frac{3}{12}$
 must re-write fractions 1st + simplify individually
 Don't use Alpha y = with r's + Fractions
 Don't simplify further b/c $3^2 = 9$
 $12^2 = 144$

5) $\sqrt{-81} =$ NOT Real Imaginary

6) $\sqrt{5+11} = \sqrt{16} = 4$

7) $-(\sqrt{144} - \sqrt{25}) = -(12 - 5) = -7$

III. Cube Roots:

A) Definition: The cube root of a number is a special value that, when used in a multiplication three times, gives that number. Example: $3 \times 3 \times 3 = 27$, so the cube root of 27 is 3. Symbol: $\sqrt[3]{\quad}$. Ex: $\sqrt[3]{27} = 3$: you would say the cube root of 27 is 3

← multiplied by itself 3 times

B) Simplify

Calc: **MATH** **4: $\sqrt[3]{\quad}$**

1) $\sqrt[3]{8} = 2$

2) $\sqrt[3]{-125} = -5$
 Real # b/c you can get a Neg # by cubing it
 $(-5)^3 = -125$

3) $\sqrt[3]{1} = 1$

4) $-\sqrt[3]{1000} = -10$

Show: $\sqrt[3]{\frac{1}{8}} = \frac{\sqrt[3]{1}}{\sqrt[3]{8}} = \frac{1}{2}$

★ Don't 1st like ()

★ #/0 also not real

IV Scientific Notation

A) Definition: a way to write very small or very large numbers. Consists of two parts (1) a number between 1 & 10 and (2) a power of n : $a \times 10^n$

** When performing operations with Scientific Numbers it is a good idea to use a set of parentheses around each scientific number!!

or use Alpha $y=$

B) Ex:s

1) Express the following in scientific notation:

a) 61,500 = 6.15×10^4

b) 0.07085 = 7.085×10^{-2}

Calc: mode \rightarrow SCI enter 2nd mode \rightarrow or clear
 * To put in SCI mode
 * Usually in normal mode

2) Express the following in standard form: (NORMAL)

a) $1.09 \times 10^3 =$
 1090

b) 4.5×10^{-2}
 $.045$

Calc: mode \leftarrow normal enter 2nd mode \rightarrow or clear

**3) Simplify the following

(Final answer in SCI mode)

* Turn to SCI mode for final answer

a) $(2.85 \times 10^7) \cdot (3.16 \times 10^{-3}) =$
 9.006×10^4

b) $\frac{3.66 \times 10^{-5}}{2 \times 10^{-3}} =$
 1.83×10^{-2}

much easier \rightarrow Can do on Alpha $y=$
 * You don't need to use ()
 * Don't need () if you do in Alpha $y=$

c) $\frac{(8.2 \times 10^6) \cdot (5 \times 10^{-2})}{(2 \times 10^2)} =$
 2.05×10^3

d) $(6.5 \times 10^3) + (2.6 \times 10^4) =$
 3.25×10^4

* Don't need () if you do in Alpha $y=$

** When comparing Scientific Numbers, the larger scientific number is the one with the higher exponent. If the exponents are the same, then compare the rational numbers themselves. \rightarrow coefficients

a) $4.45 \times 10^3 < 6.3 \times 10^5$

b) $2.82 \times 10^6 > 1.3 \times 10^6$

$3 < 5$

$2.82 > 1.3$