Int 2	Notes 6-5 Introduction to Roots	Unit 6

Warm up:

Evaluate the expression. Write your answer in scientific notation.

1. **0.0000000003675** 3.675×10^{-10}

2. $\left(3\times10^{-13}\right)-\left(3\times10^{-14}\right)$

$$\begin{array}{r} 3\times10^{-13} \\ -\ \frac{3}{10}\times10^{-14}\cdot10 \\ \hline \end{array}$$

$$\begin{array}{r} 3\times10^{-13} \\ -\ .3\times10^{-13} \\ \hline 2.7\times10^{-13} \end{array}$$

3. $\left(5\times10^{17}\right)+\left(9\times10^{19}\right)$

4. $\left(4\times10^{7}\right)\left(9\times10^{13}\right)$

$(4\cdot9)(10^{7}\cdot10^{13})$

$$\begin{array}{c} 36\times10^{20+1} \\ \hline 3.6\times10^{21} \end{array}$$

5. $\dfrac{\boxed{12}\times\boxed{10^{15}}}{\boxed{3}\times\boxed{10^{6}}}$

4×10^{9}

Rules of Divisibility:

957
21

14+7

2: if the # is even (ends with 0, 2, 4, 6, 8)

3: if you add up the digits to a # that can be ÷ 3

5: if it ends in 5 or 0

10: if it ends in 0

PRIME #: a # that is only divisible by 1 & itself

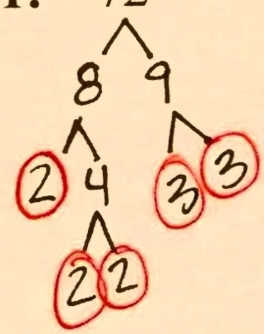
2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41

Introduction to Roots

Factor Trees: find all the prime #s that will Multiply together to make the original

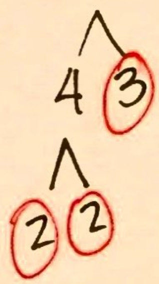
Make a factor tree for each of the following numbers.

Ex. 1: 72



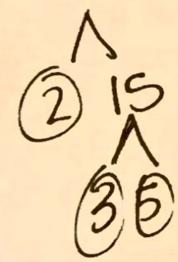
$2 \cdot 2 \cdot 2 \cdot 3 \cdot 3$

Ex. 2: 12



$2 \cdot 2 \cdot 3$

Ex. 3: 30



$2 \cdot 3 \cdot 5$

$1^2 = 1$	$6^2 = 36$	$11^2 = 121$	$16^2 = 256$
$2^2 = 4$	$7^2 = 49$	$12^2 = 144$	$17^2 = 289$
$3^2 = 9$	$8^2 = 64$	$13^2 = 169$	$18^2 = 324$
$4^2 = 16$	$9^2 = 81$	$14^2 = 196$	$19^2 = 361$
$5^2 = 25$	$10^2 = 100$	$15^2 = 225$	$20^2 = 400$

Introduction to Roots

Square Root: the opposite of squaring

$\sqrt{16} = 4$

what # will multiply to itself and equal the # "inside"?

$\underline{4} \cdot \underline{4} = 16$

Simplify the expression.

Ex. 4: $\sqrt{256} = 16$

Ex. 6: $-\boxed{\sqrt{64}}$ -8

$\sqrt{-64}$ = Not Real

Ex. 5: $\frac{3^2}{7^2} = \frac{9}{49}$

Ex. 7: $\sqrt{\frac{16}{25}} = \frac{\sqrt{16}}{\sqrt{25}} = \frac{4}{5}$

Cube: $2^3 = 2 \cdot 2 \cdot 2 = 8$

Cubic Root: the opposite of cubing

$4 \cdot 4 \cdot 4 = 64$

$\sqrt[3]{64} = 4$

What # will multiply to itself 3 times to equal the # inside?

Ex. 8: $5^3 = 125$

Ex. 10: $4^3 = 64$

Ex. 9: $\sqrt[3]{125} = 5$

Ex. 11: $\sqrt[3]{8} = 2$

Int 2	Notes 6-5 Introduction to Roots	Unit 6

$1^3 = 1$ $3^3 =$ $5^3 =$

$2^3 =$ $4^3 =$

Opposite Operations:

$\sqrt{\ }$ & ^{2} are opposites

$\sqrt[3]{\ }$ & ^{3} are opposites

$$x + \cancel{3} = 5$$
$$\quad -\cancel{3} \quad -3$$

Solve for the given variable.

Ex. 12: $\cancel{\sqrt{x^2}} = \sqrt{25}$ $x^2 = 25$

$x = 5$

Ex. 14: $(\sqrt{x})^{\cancel{2}} = (4)^2$

$x = 16$

Ex. 13: $\cancel{\sqrt[3]{x^3}} = \sqrt[3]{64}$

$x = \sqrt[3]{64}$

$x = 4$

Ex. 15: $(\sqrt[3]{x})^{\cancel{3}} = (27)^3$

$x = 19{,}683$