- Without the aid of a calculator arrange the following radicals in descending order:

=> 4 Between 2 & 3

$\sqrt[3]{13}, \sqrt{18}, \sqrt{9}, \sqrt[4]{27}, \sqrt[3]{-5}$

Between 2 & 3 =3 Some (-) Number

- What strategies were used ?

≈2.3 ≈2.2

$\sqrt{18}, \sqrt{9}, \sqrt[3]{13}, \sqrt[4]{27}, \sqrt[3]{-5}$

2.35 2.28

Pre-requisite skill...

Solve this inequation:

$$4x + 5 > 9x - 10$$

$$\frac{-5x}{-5} > \frac{-15}{-5}$$

$3 > x$ $\qquad$ $x < 3$

Let's revisit restrictions...

State any restrictions on the following radicals:

$\sqrt{3x+5}$

$3x+5 \geq 0$

$\frac{3x}{3} \geq \frac{-5}{3}$

$x \geq -\frac{5}{3}$

$\sqrt[5]{4-x}$

None

$\sqrt[12]{5-3x}$

$5-3x \geq 0$

$\frac{-3x}{-3} \geq \frac{-5}{-3}$

$x \leq \frac{5}{3}$

$\sqrt[6]{4x^8}$

None

Always (+)

- Simplifying Radicals

Required prior knowledge:

- Expressing radicals as exponents

$\sqrt{x} \rightarrow x^{\frac{1}{2}}$

$16^{1/2} = \sqrt{16}$

$= 4$

$\sqrt[7]{x} \rightarrow x^{1/7}$

$\sqrt[5]{x^9} = x^{9/5} = \left(\sqrt[5]{x}\right)^9$

ex. $8^{5/3} = 32$

$\left(\sqrt[3]{8}\right)^5$

$\frac{x^4}{x^9}$

$16^{-\frac{3}{4}} = \frac{1}{16^{3/4}}$

$= \frac{1}{8}$

$w^0 = 1$

$3w^0 = 3(1)$

$(3w)^0 = 1$

- Converting radicals between forms (Mixed <--> Entire)

$9\sqrt{50}$

$9(\sqrt{25\cdot 2})$

$9(5\sqrt{2})$

$45\sqrt{2}$

$\sqrt{12}$ $(\sqrt{4\times 3}$

$2\sqrt{3}$

$\sqrt{50}$

$=5\sqrt{2}$

$\sqrt{27}=\sqrt{9\times 3}$

$3\sqrt{3}=\sqrt{9}\times\sqrt{3}$

$3\sqrt{3}$

$\sqrt{72}=6\sqrt{2}$

$\sqrt{9\times 8}$

$3\sqrt{8}$

$\sqrt[3]{40}$

$\sqrt[3]{8\cdot 5}$

$=2\sqrt[3]{5}$

$\sqrt{8}=2\sqrt{2}$

$2\sqrt[5]{96}$

$2\sqrt[5]{32\cdot 3}$

$2(2\sqrt[5]{3})$

$4\sqrt[5]{3}$

$5\sqrt{2}$

$=\sqrt{5^2\cdot 2}$

$=\sqrt{50}$

$3\sqrt{5}$

$=\sqrt{45}$

$2\sqrt[3]{5}$

$\sqrt[3]{2^3\cdot 5}$

$=\sqrt[3]{40}$

Simplifying radicals involving variables:

$\sqrt{x^{16}} = (x^{16})^{\frac{1}{2}}$

$= x^8$

$\sqrt[3]{w^{27}} = (w^{27})^{1/3}$

$= w^9$

$\sqrt[5]{32y^{10}}$ $(y^{10})^{\frac{1}{5}}$

$= 2y^2$

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What if things do not work out as nicely??

$\sqrt{x^{11}}$

$\sqrt{x^{10} \cdot x^1}$

$x^5\sqrt{x}$

$\sqrt[3]{w^{17}}$

$\sqrt[3]{w^{15} \cdot w^2}$

$w^5\sqrt[3]{w^2}$

$\sqrt{27x^6y^5}$

$\sqrt{9 \cdot 3x^6y^4 \cdot y^1}$

$= 3x^3y^2\sqrt{3y}$

$\sqrt[4]{16a^5b^{18}}$

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

$\sqrt[3]{-8} = -2$

Homework:

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