ISOLATING A VARIABLE -(continued) DEALING w/ P^2 OR T^4 OR R^3

NOTE: YOU CANNOT SIMPLY CANCEL OUT A "SQUARED" SIGN.

FOR EX: $\frac{M_E P_E^2}{M_\odot P_\odot^2} = \frac{R_E^3}{R_\odot^3}$ SAY YOU WANT TO SOLVE FOR P:

THIS DOES NOT EQUAL $\frac{M_E}{M_\odot}\frac{P_E^{\not 2}}{P_\odot^{\not 2}} = \frac{M_E}{M_\odot}\frac{P_E}{P_\odot}$

THE ONLY WAY TO GET RID OF IT IS TO TAKE THE SQUARE ROOT OF EVERYTHING IN THE EQN

$$\sqrt{\frac{M_E}{M_\odot}}\sqrt{\frac{P_E^2}{P_\odot^2}} = \sqrt{\frac{M_E}{M_\odot}}\frac{P_E}{P_\odot} = \sqrt{\frac{R_E^3}{R_\odot^3}}$$

LIKEWISE, IF YOU WANT TO SOLVE FOR R,
TAKE THE CUBE ROOT OF EVERYTHING IN THE EQ'N:

$$\left[\frac{M_E}{M_\odot}\left(\frac{P_E}{P_\odot}\right)^2\right]^{1/3} = \left[\left(\frac{R_E}{R_\odot}\right)^3\right]^{1/3}$$

NOTE $(R^{1/3})^3 = R^{\frac{1}{3}\cdot 3} = R^1$

$$\left(\frac{M_E}{M_\odot}\right)^{1/3}\left(\frac{P_E}{P_\odot}\right)^{2/3} = \boxed{\frac{R_E}{R_\odot}}$$

Likewise: solve for T:

$L = 4\pi\sigma R^2 T^4$ $\qquad T^4 = \frac{L}{4\pi\sigma R^2}$

$$\boxed{T = \left(\frac{L}{4\pi\sigma R^2}\right)^{1/4}}$$

DEALING WITH: POWERS OF 10

$10^a \cdot 10^b = 10^{a+b}$ $\qquad$ Ex: $10^2 \cdot 10^3 = 10^{2+3} = 10^5$

$\frac{10^a}{10^b} = 10^a \cdot 10^{-b} = 10^{a-b}$ $\qquad$ Ex: $\frac{10^3}{10^2} = 10^{3-2} = 10^1$

$10^{-a} = \frac{1}{10^a}$ $\qquad$ Ex: $\frac{10^2}{10^3} = 10^{2-3} = 10^{-1} = \frac{1}{10}$

$(10^a)^b = 10^{a \cdot b}$ $\qquad$ Ex: $(10^3)^2 = 10^{3\cdot 2} = 10^6$

$(10^{-2})^4 = 10^{-2\cdot 4} = 10^{-8}$