ALGEBRA REVIEW

$$a^t = e^{t\ln(a)} \; ; \; a^m \cdot a^n = a^{(m+n)}$$

$$(ab)^n = a^n b^n \; ; \; (a^m)^n = a^{(m\times n)}$$

$$\sqrt[n]{a} = a^{\frac{1}{n}} \; ; \; \left(\frac{a}{b}\right)^n = \frac{a^n}{b^n} \; ; \; a^{-n} = \frac{1}{a^n}$$

$$\sqrt[n]{ab} = \left(\sqrt[n]{a}\right)\left(\sqrt[n]{b}\right) = \left(a^{\frac{1}{n}}\right)\left(b^{\frac{1}{n}}\right) = (ab)^{\frac{1}{n}}$$

$$\sqrt[n]{a^m} = \left(a^m\right)^{\frac{1}{n}} = a^{\left(\frac{1}{n}\times m\right)} = a^{\left(\frac{m}{n}\right)}$$

AN APPLICATION: SIMPLIFY $\sqrt[n]{2^{(1+5n)}}$:

$$\sqrt[n]{2^{(1+5n)}} = \left(2^{(1+5n)}\right)^{\frac{1}{n}} = 2^{\left(\frac{1}{n}(1+5n)\right)} =$$

$$= 2^{\left(\frac{1+5n}{n}\right)} = 2^{\left(\frac{1}{n}+5\right)} = 2^{\frac{1}{n}}\cdot 2^5$$

$$= 2^5 \cdot 2^{\frac{1}{n}} = \boxed{32\sqrt[n]{2}}$$