Exponents: Review

1. Change the base using exponents
2. Apply exponent laws
   a). $2^3 \cdot 2^5 = 2^8$
   Add exponents if the bases are the same
   b). $\frac{2^3}{2^5} = 2^{-2}$ (only if the bases are the same)
   negative exponents c). $2^{-2} = \frac{1}{2^2}$ use the inverse to change a negative exponent to a positive one.
   chain law d). $(2^3)^5 = 2^{15}$ multiply the exponent on the outside with each on the inside
   $(2^1x^3)^5 = 2^5x^{15}$
3. Solve exponential Equations
   i) Change bases
   ii) Simplify using exponent laws
   iii) Remove the bases
   iv) Solve for x algebraically

ex: $2^x = 32 \quad 32 = 2^5 \quad 2^x = 2^5 \quad x = 5$

ex 5: $27^x = 9^{x+1} \quad 27 = 3^3$

$= (3^3)^x = (3^2)^{x+1} \quad 9 = 3^2$

$= 3^{3x} = 3^{2x+2}$

$= 3x = 2x + 2$

$-2x \quad -2x$

$x = 2$

ex 30: $\left(\frac{81^2 \cdot 9^x}{729^3}\right)^{-1} = \frac{3^{3x+1}}{9^x} \rightarrow \left(\frac{(3^4)^2 (3^2)^x}{(3^6)^3}\right) = \frac{3^{3x+1}}{(3^2)^x}$

$\rightarrow \frac{3^8 \cdot 3^{2x}}{3^{18}} = \frac{3^{3x+1}}{3^{2x}}$ $\Big\}$ $3^{8+2x-18} = 3^{3x+1-2x}$

$2x - 10 = 1x + 1$

$-1x \quad +10 \quad -1x \quad +10 \quad x = 11$

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