Quiz Notes #2

log properties

① $\log_b(xy) = \log_b x + \log_b y$

② $\log_b\left(\frac{x}{y}\right) = \log_b x - \log_b y$

③ $\log_b x^n = n \cdot \log_b x$

} use these for expanding & condensing into 1 log

condense

- write with one log

expand

- end product should have multiple logs & no exponents

ex $2\log_2 x - 3\log_2 y + \frac{1}{2}\log_2 z$

$\log_2 x^2 - \log_2 y^3 + \log_2 z^{1/2}$

$\log_2\left(\frac{x^2}{y^3} \cdot z^{1/2}\right) = \boxed{\log_2\left(\frac{x^2 z^{1/2}}{y^3}\right)}$

ex $\log\left(\frac{7^2 x^3}{z^2 y^{5/4}}\right) = \log 7^2 + \log x^3 - \log z^2 - \log y^{5/4}$

$= \boxed{2\log 7 + 3\log x - 2\log z - \frac{5}{4}\log y}$

solving for x

when it's log = # form

1. condense log
2. write exp. form
3. solve for x.

ex $\log_2(x+4) - \log_2 3 = 3$

$\log_2\left(\frac{x+4}{3}\right) = 3$

$2^3 = \frac{x+4}{3}$

$8 = \frac{x+4}{3}$

$24 = x+4$

$\boxed{20 = x}$

when it's exp. form

1. make $b^x = \#$ form
2. write as a log.
3. change of base
4. solve for x

ex $\frac{5(7^{x-2})}{5} = \frac{10}{5}$

$7^{x-2} = 2$

$\log_7 2 = x-2$

$\frac{\log 2}{\log 7} = x-2$

$\boxed{\frac{\log 2}{\log 7} + 2 = x}$

When it's log = log form

1. condense both sides to 1 log
2. ~~solve for~~ ignore the logs
3. solve for x

ex $\log_2(x+5) + \log_2(7) = \log_2(4x-9)$

$\log_2(7(x+5)) = \log_2(4x-9)$

$7(x+5) = 4x-9$

$7x+35 = 4x-9$

$3x = -44$

$\boxed{x = -44/3}$

* remember

$\log_b y = x \longleftrightarrow b^x = y$