5.2

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"40" (similar) $15^{10} \cdot 24^{7} \cdot 125^{6}$

$= (3^1 \cdot 5^1)^{10} \cdot (2^3 \cdot 3^1)^{7} \cdot (5^3)^{6}$

$= 3^{10} \cdot 5^{10} \cdot 2^{21} \cdot 3^{7} \cdot 5^{18}$

$= \boxed{2^{21} \cdot 3^{17} \cdot 5^{28}}$

$15 = 3 \cdot 5$

$24 = 2^3 \cdot 3$

2 12

2 6

2 3

$125 = 5^3$

5 25

5 5

other than a factor Tree

3

$2 \overline{)6}$

$2 \overline{)12}$

$2 \overline{)24} = 2^3 \cdot 3$

Find the GCF (GCD or) & LCM of X, Y, and Z, where

$X = 2^3 \cdot 3^7 \cdot 7^2 \cdot 5^0$, $Y = 2^4 \cdot 3^1 \cdot 5^3 \cdot 7^0$,

and $Z = 2^0 \cdot 3^2 \cdot 5^1 \cdot 7^3 \cdot 11^2$.

$GCD/GCF = 2^0 \cdot 3^1 \cdot 5^0 \cdot 7^0 \cdot 11^0$

$= 1 \cdot 3 \cdot 1 \cdot 1 \cdot 1 = \boxed{3}$

$LCM = \boxed{2^4 \cdot 3^7 \cdot 5^3 \cdot 7^3 \cdot 11^2}$

Ch. 6 Fractions

When Adding or Subtract fractions we require a common Denominator.

e.g. ① $\frac{3}{3}\cdot\frac{1}{2} + \frac{1}{3}\cdot\frac{2}{2}$

We use 6 as the common Denominator (since both 2 & 3 are factors of 6)

$= \frac{3}{6} + \frac{2}{6}$

$= \frac{3+2}{6} = \boxed{\frac{5}{6}}$

② $\frac{5}{12} - \frac{3}{16}$

We could use $12\cdot 16 = 192$ as the common Denominator

$= \frac{2^2}{2^2}\cdot\frac{5}{2^2\cdot 3^1} - \frac{3}{2^4\cdot 3^0}\cdot\frac{3^1}{3^1}$

$= \frac{20}{48} - \frac{9}{48} = \boxed{\frac{11}{48}}$

Instead use the LCM!

$12 = 2^2\cdot 3^1,\ 16 = 2^4\cdot 3^0$

$\Rightarrow LCM = 2^4\cdot 3^1$
$= 16\cdot 3 = 48$

$\Rightarrow$ 48 is the LCD - Lowest common Denominator

VS. Using 192 as the common Denom.

$\frac{5}{12}\cdot\frac{16}{16} - \frac{3}{16}\cdot\frac{12}{12} = \frac{80}{192} - \frac{36}{192} = \frac{44}{192}$

$\frac{44\div 2}{192\div 2} = \frac{22\div 2}{96\div 2} = \boxed{\frac{11}{48}}$

Give answer in simplest form.

(3) $\dfrac{17}{336} + \dfrac{103}{292}$

$= \dfrac{17}{2^4 \cdot 3 \cdot 7} \cdot \dfrac{73}{73} + \dfrac{103}{2^2 \cdot 73} \cdot \dfrac{2^2 \cdot 3 \cdot 7}{2^2 \cdot 3 \cdot 7}$

$= \dfrac{1241 + 8652}{2^4 \cdot 3 \cdot 7 \cdot 73}$

$= \boxed{\dfrac{9893}{2^4 \cdot 3 \cdot 7 \cdot 73} = \dfrac{9893}{24{,}528}}$

$336 = 2^4 \cdot 3 \cdot 7$

336 → 2, 168 → 2, 84 → 2, 42 → 2, 21 → 3, 7

$292 = 2^2 \cdot 73$

292 → 2, 146 → 2, 73

$\Rightarrow$ LCD = LCM of 336 & 292

$= 2^4 \cdot 3^1 \cdot 7^1 \cdot 73^1$

$= 24{,}528$

(4) $\dfrac{61}{1500} - \dfrac{71}{4725}$

$1500 = 2^2 \cdot 3 \cdot 5^3$

$4725 = 3^3 \cdot 5^2 \cdot 7$

$LCD = 2^2 \cdot 3^3 \cdot 5^3 \cdot 7$

$= 94{,}500$

$= \dfrac{61}{2^2 \cdot 3 \cdot 5^3} \cdot \dfrac{3^2 \cdot 7}{3^2 \cdot 7} - \dfrac{71}{3^3 5^2 \cdot 7} \cdot \dfrac{2^2 \cdot 5}{2^2 \cdot 5}$

$= \dfrac{3843 - 1420}{2^2 \cdot 3^3 \cdot 5^3 \cdot 7}$

$= \boxed{\dfrac{2423}{2^2 \cdot 3^3 \cdot 5^3 \cdot 7} = \dfrac{2423}{94{,}500}}$