

Addition:

$$\begin{array}{r}
 42 \\
 + 23 \\
 \hline
 65
 \end{array}
 \quad
 \begin{array}{r}
 -65 \\
 -42 \text{ (or) } -23 \\
 \hline
 23 \qquad 42
 \end{array}$$

Decimal:

$$\begin{array}{r}
 2.5 \\
 + 9.2 \\
 \hline
 11.7
 \end{array}
 \quad
 \begin{array}{r}
 -11.7 \\
 -2.5 \\
 \hline
 09.2
 \end{array}
 \quad
 \begin{array}{r}
 -11.7 \\
 -9.2 \\
 \hline
 2.5
 \end{array}$$

Fraction:

$$\textcircled{1} \quad \frac{2}{3} + \frac{9}{3} = \frac{2+9}{3} = \frac{11}{3}$$

$$\begin{aligned}
 &= \overset{1}{0}.\overset{1}{6}\overset{1}{6} + 3 \\
 &= 3.\overset{1}{6}\overset{1}{6}
 \end{aligned}$$

2

$$\begin{aligned}
 \frac{2}{5} + \frac{4}{2} &= \frac{2}{5} \times 1 + \frac{4}{2} \times 1 = \frac{2}{5} \times \frac{2}{2} + \frac{4}{2} \times \frac{5}{5} = \frac{2 \times 2 + 4 \times 5}{5 \times 2} = \frac{4 + 20}{10} = \frac{24}{10} = 2.4 \\
 &= \frac{2 \times 2 \times 2 \times 3}{2 \times 5} = \frac{12}{5}
 \end{aligned}$$

✓ 0.66...
3) 2.00...
0

$$\begin{array}{r}
 20 \\
 18 \\
 \hline
 02
 \end{array}
 \quad \checkmark$$

$$\begin{array}{r}
 3.66... \\
 3 \overline{)11.00...} \\
 9 \\
 \hline
 020 \\
 18 \\
 \hline
 020 \\
 18 \\
 \hline
 02...
 \end{array}$$

Subtraction

normal:
$$\begin{array}{r} 525 \\ -442 \\ \hline 083 \end{array}$$

$$\begin{array}{r} 442 \\ +083 \\ \hline 525 \end{array}$$

$$\begin{array}{r} 0.8 \\ 514.0 \\ \hline 0 \\ 40 \\ 40 \\ \hline 00 \end{array}$$

$$\begin{array}{r} 0.133\ldots \\ 1512.00 \\ \hline 0 \\ 20 \\ 15 \\ \hline 050 \\ 45 \\ \hline 05 \end{array}$$

decimal:
$$\begin{array}{r} 9.5 \\ -4.2 \\ \hline 5.3 \end{array}$$

$$\begin{array}{r} 5.3 \\ -4.2 \\ \hline 9.5 \end{array}$$

$$\begin{array}{r} 0.8000 \\ -0.6666\ldots \\ \hline 0.1334 \end{array}$$

fraction:

$$\frac{2}{3} - \frac{4}{5} = \frac{2}{3} \times 1 - \frac{4}{5} \times 1 = \frac{2}{3} \times \frac{5}{5} - \frac{4}{5} \times \frac{3}{3} = \frac{2 \times 5 - 4 \times 3}{5 \times 3} = \frac{10 - 12}{15} = -\frac{2}{15}$$

$$\frac{2}{3} - \frac{4}{5}$$

$$\begin{aligned} &= 0.66 - 0.8 \\ &= -0.1333\ldots \end{aligned}$$

$$= -0.\overline{133}$$

Answer is not same. I don't know why?
 ↳ Because you only took 4 digits after point!

Multiplication

$$\begin{array}{r}
 42 \\
 \times 13 \\
 \hline
 126 \\
 + 420 \\
 \hline
 546
 \end{array}$$

$$\begin{array}{r}
 42 \\
 13 \overline{)546} \\
 \hline
 52 \\
 - 26 \\
 \hline
 26 \\
 - 26 \\
 \hline
 00
 \end{array}$$

$$\begin{array}{r}
 4.5 \\
 2500 \overline{)11250.0} \\
 \hline
 10000 \\
 \hline
 012500 \\
 - 12500 \\
 \hline
 00000
 \end{array}$$

Decimal:

$$\textcircled{1} \quad 2.5 \times 10 = 25 \quad \left| \quad 25 \div 10 = 2.5 \right.$$

$$\begin{aligned}
 \textcircled{2} \quad & 2.5 \times 4.5 \quad \left| \quad 11.25 \div 2.5 \right. \\
 &= \frac{25}{10} \times \frac{45}{10} \quad \left| \quad = \frac{1125}{100} \div \frac{25}{10} \right. \\
 &= \frac{1125}{100} \times 10 \quad \left| \quad = \frac{1125}{100} \times \frac{10}{25} \right. \\
 &= \frac{1125}{25} \times 10 \quad \left| \quad = \frac{11250}{100} \times 10 \right. \\
 &= \frac{11250}{2500} \quad \left| \quad = \frac{1125}{250} \times \frac{10}{10} \right. \\
 &= 4.5
 \end{aligned}$$

$$\begin{array}{r}
 45 \\
 \times 25 \\
 \hline
 225 \\
 900 \\
 \hline
 1125
 \end{array}
 \left| \quad \begin{array}{r}
 2500 \\
 + 4 \\
 \hline
 10000 \\
 \\
 2500 \\
 \times 5 \\
 \hline
 12500
 \end{array} \right.$$

Fraction: $\frac{2}{3} \times \frac{4}{5} = \frac{2 \times 4}{3 \times 5} = \frac{8}{15}$

$0.\overline{66} \times 0.8$ $= 0.533 \dots$

$= 0.5328$

NOT same?



Because you
are using
finite number
of digits (4)
and not infinite

$$\begin{array}{r}
 & 0.533 \dots \\
 15 & \overline{) 8.000 \dots} \\
 & \underline{80} \\
 & 75 \\
 & \underline{50} \\
 & 45 \\
 & \underline{50} \\
 & 45 \\
 & \underline{5} \\
 & \dots
 \end{array}$$

0.66×0.8

$= \frac{66}{1000} \times 8$

$= \frac{5328}{10000}$

$= 0.5328$

$$\begin{array}{r}
 54 \\
 666 \\
 \times 8 \\
 \hline
 5328
 \end{array}$$

$$\begin{aligned}\text{Fraction: } & \frac{2}{3} \times \frac{4}{5} \times \frac{3}{6} \\ &= \left(\frac{2+4}{3+5} \right) \times \frac{3}{6} \\ &= \left(\frac{2 \times 4}{3+5} \right) \times \frac{3}{6} \\ &= \frac{2 \times 4 \times 3}{3+5+6} \\ &= \frac{24}{90}\end{aligned}$$

Normal:
$$\begin{array}{r} 57 \\ 11 \overline{)628} \\ 55 \\ \hline 078 \\ 77 \\ \hline 01 \end{array}$$

Division

$$\begin{array}{r} 57 \\ + 11 \\ \hline 57 \end{array}$$

$$\begin{array}{r} 570 \\ 627 \\ \hline + 1 = 628 \end{array}$$

$$\begin{array}{r} 2.083... \\ 120 \overline{)250.000} \\ 240 \\ \hline 0100 \\ 0 \\ \hline 1000 \\ 960 \\ \hline 00400 \\ 360 \\ \hline 040... \end{array}$$

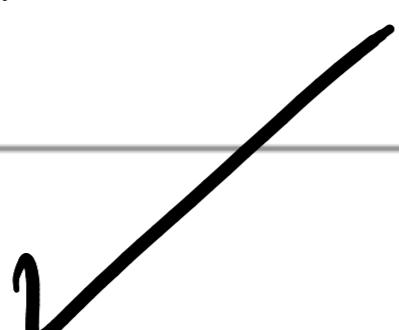
decimal: $2.5 \div 1.2$

$$= \frac{25}{10} \div \frac{12}{10}$$

$$= \frac{25}{10} \times \frac{10}{12}$$

$$= 250$$

$$\begin{array}{r} 120 \\ - 250 \\ \hline 0833 \end{array}$$



Reaction:

$$\frac{2}{3} \div \frac{5}{4} = \frac{2}{3} \times \frac{4}{5} = \frac{2 \times 4}{3 \times 5} = \frac{8}{15}$$
$$= 0.66\overline{6} \div 1.25$$

$$= 0.5328$$

$$= 0.533\dots$$

not same. Why?

$$\begin{array}{r} 1.25 \\ 4 \overline{) 5.00} \\ \underline{-4} \\ \hline 10 \\ \underline{-8} \\ \hline 20 \\ \underline{-20} \\ \hline 00 \end{array}$$
$$\begin{array}{r} 125 \\ + 3 \\ \hline 250 \\ \underline{-250} \\ \hline 00 \end{array}$$
$$\begin{array}{r} 125 \\ \times 3 \\ \hline 375 \end{array}$$
$$0.666 \div 1.25$$

$$\begin{array}{r} 0.5328 \\ 125000 \overline{) 66600.0000} \\ \underline{-625000} \\ \hline 41000 \\ \underline{-375000} \\ \hline 35000 \\ \underline{-25000} \\ \hline 100000 \\ \underline{-100000} \\ \hline 0000000 \end{array}$$

$$\begin{array}{r} 0.533\dots \\ 15 \overline{) 8.000\dots} \\ \underline{-75} \\ \hline 80 \\ \underline{-75} \\ \hline 50 \\ \underline{-50} \\ \hline 0 \end{array}$$
$$\begin{array}{r} 75 \\ \times 25 \\ \hline 1875 \\ \underline{-1500} \\ \hline 375 \\ \underline{-375} \\ \hline 0 \end{array}$$
$$\begin{array}{r} 45 \\ \times 1000 \\ \hline 45000 \end{array}$$
$$\begin{array}{r} 45 \\ \times 12 \\ \hline 540 \end{array}$$

$$= \frac{666}{1000} \div 125$$
$$= \frac{666 \times 100}{1000 \times 125}$$
$$= \frac{66600}{125000}$$
$$= 528$$

Expression ① $2 \times (3+4) - (6/3)$

$$(2 \times 7) - 2$$

$$= 14 - 2$$

$$= 12$$

✓

② $4^2 + (4^3 \times 2) + 9^2$

$$= 4^2 + (64 \times 2) + 9^2$$

$$= 4^2 + 128 + 9^2$$

$$= 16 + 128 + 81$$

$$= 144 + 81$$

$$= 225$$

✓

numbers after
① repeating decimal point \rightarrow fraction

$$\begin{array}{r} 213.44\overline{4} \\ - 10x = \underline{\overline{2}} \quad 1 \quad 3 \quad 4.44\dots \\ - x = \underline{\overline{2}} \quad 1 \quad 3.4\overline{4}\dots \\ \hline 9x = \underline{\overline{192}} \quad 1.00\dots \end{array}$$

$$x = \frac{192}{9}$$

$$213\overline{4444} = \frac{2134444}{100000}$$

$$213.44\dots$$

$$9 \overline{)1921.00\dots}$$

$$\begin{array}{r} 18 \\ 0 \overline{)2} \end{array}$$

$$\begin{array}{r} 9 \\ 0 \overline{)3} \quad 1 \\ \quad 2 \overline{)1} \\ \hline 040 \end{array}$$

$$\begin{array}{r} 36 \\ 0 \overline{)4} \quad 0 \\ \quad 36 \\ \hline 04. \quad , \end{array}$$

③ Improper frac \rightarrow mixed

$$\begin{array}{r} 1 \\ 8 \overline{)11} \\ \underline{-8} \\ 03 \end{array}$$

$$\frac{11}{8} = 1 + \frac{3}{8} = 1\frac{3}{8}$$

$$\frac{12}{7} = 1\frac{5}{7}$$

Mixed \rightarrow Improper

$$\textcircled{1} \quad 9\frac{2}{5} = \frac{(9 \times 5) + 2}{5} = \frac{45 + 2}{5} = \frac{47}{5}$$

$$9\frac{2}{5} = 9 + \frac{2}{5} = 9 + 1 + \frac{2}{5} = 9 \times \frac{5}{5} + \frac{2}{5} = \frac{9 \times 5 + 2}{5} = \frac{47}{5}$$