NS8-28 Operations with Fractions

1. Evaluate these expressions. Do the operation in brackets first.

a) $\frac{2}{3}+\left(\frac{1}{5}\times 4\right)=\frac{22}{15}=1\frac{7}{15}$ b) $\left(\frac{2}{3}+\frac{1}{5}\right)\times 4=\frac{52}{15}=3\frac{2}{15}$ c) $\frac{1}{5}+\left(\frac{4}{3}\div 2\right)\frac{26}{30}=\frac{13}{15}$ d) $\left(\frac{1}{5}+\frac{4}{3}\right)\div 2=\frac{23}{30}$

e) $\frac{4}{3}-\left(\frac{2}{5}\times 2\right)\frac{8}{15}$ f) $\left(\frac{4}{3}-\frac{2}{5}\right)\times 2=\frac{24}{15}=1\frac{13}{15}$ g) $\frac{4}{3}-\left(\frac{2}{5}\div 2\right)\frac{24}{30}=1\frac{2}{15}$ h) $\left(\frac{4}{3}-\frac{2}{5}\right)\div 2=\frac{14}{30}=\frac{7}{15}$

2. Compare the problems in Question 1 that use the same operations and numbers.

Does the order you do the operations in affect the answer? Yes

REMINDER ▶ Mathematicians have ordered the operations to avoid writing brackets all the time.

The order is:

1. Operations in brackets
2. Multiplication and division, from left to right
3. Addition and subtraction, from left to right

Examples: $5-3\times\frac{2}{3}+6=5-2+6=3+6=9$ but $(5-3)\times\left(\frac{2}{3}+6\right)=2\times\frac{20}{3}=\frac{40}{3}=13\frac{1}{3}$

3. Evaluate.

a) $\left(\frac{2}{3}+\frac{1}{2}\right)\times\frac{1}{4}\ \frac{7}{24}$ b) $\frac{2}{3}+\frac{1}{2}\times\frac{1}{4}\ \frac{19}{24}$ c) $\frac{3}{2}+\frac{1}{4}\times\frac{3}{4}\ \frac{27}{16}=1\frac{11}{16}$ d) $\frac{3}{2}\times\left(8\div\frac{3}{4}\right)=\frac{96}{6}=16$

e) $\frac{5}{2}\div 5\times\frac{4}{5}\ \frac{20}{50}=\frac{2}{5}$ f) $\frac{5}{2}\div\left(5\times\frac{4}{5}\right)\frac{25}{40}=\frac{5}{8}$ g) $\frac{2}{3}+\frac{1}{2}-\frac{1}{4}\ \frac{11}{12}$ h) $\frac{2}{3}+\left(\frac{1}{2}-\frac{1}{4}\right)\frac{11}{12}$

i) $\frac{2}{3}-\frac{1}{4}+\frac{1}{2}\ \frac{11}{12}$ j) $\frac{2}{3}-\left(\frac{1}{4}+\frac{1}{2}\right)-\frac{1}{12}$ k) $\frac{2}{3}-\frac{1}{4}\times\frac{1}{2}\ \frac{13}{24}$ l) $\left(\frac{2}{3}-\frac{1}{4}\right)\times\frac{1}{2}\ \frac{5}{24}$

4. Remove any brackets that are not necessary.

Note: In some expressions, all brackets will be necessary.

a) $\frac{2}{3}+\left(\frac{1}{2}-\frac{1}{3}\right)$ Not necessary

b) $\frac{2}{3}\times\left(\frac{1}{2}-\frac{1}{3}\right)$ Necessary

c) $\left(\frac{1}{2}\times\frac{1}{3}\right)+\left(\frac{1}{3}-\frac{1}{4}\right)$ 1st not necessary, 2nd necessary

d) $\left[\frac{1}{2}-\left(\frac{1}{3}+\frac{1}{4}\right)\right]\times\frac{1}{5}$ [ ]: Necessary, ( ): Not necessary