1. First make like units, then add.

a. \[ \frac{3}{4} + \frac{1}{7} = \frac{21}{28} + \frac{4}{28} = \frac{25}{28} \]

b. \[ \frac{1}{4} + \frac{9}{8} = \frac{1\times2}{4\times2} + \frac{9}{8} = \frac{2}{8} + \frac{9}{8} = \frac{11}{8} = \frac{3}{8} \]

c. \[ \frac{3}{8} + \frac{3}{7} = \frac{3\times7}{8\times7} + \frac{3\times8}{7\times8} = \frac{21}{56} + \frac{24}{56} = \frac{45}{56} \]

d. \[ \frac{2}{9} + \frac{4}{7} = \frac{4\times7}{9\times7} + \frac{4\times9}{7\times9} = \frac{28}{63} + \frac{36}{63} = \frac{64}{63} = \frac{1}{63} \]

e. \[ \frac{1}{5} + \frac{2}{3} = \frac{1\times3}{5\times3} + \frac{2\times5}{3\times5} = \frac{3}{15} + \frac{10}{15} = \frac{13}{15} \]

f. \[ \frac{3}{4} + \frac{5}{6} = \frac{3\times6}{4\times6} + \frac{5\times4}{6\times4} = \frac{18}{24} + \frac{20}{24} = \frac{38}{24} = \frac{14+2}{24+2} = \frac{17}{12} \]

g. \[ \frac{2}{3} + \frac{1}{11} = \frac{2\times11}{3\times11} + \frac{1\times3}{11\times3} = \frac{22}{33} + \frac{3}{33} = \frac{25}{33} \]

h. \[ \frac{3}{4} + \frac{1}{10} = \frac{3\times10}{4\times10} + \frac{1\times4}{10\times4} + 1 = \frac{30}{40} + \frac{4}{40} + 1 = \frac{34}{40} = \frac{17}{20} \]
2. Whitney says that to add fractions with different denominators, you always have to multiply the denominators to find the common unit; for example:

\[
\frac{1}{4} + \frac{1}{6} = \frac{6}{24} + \frac{4}{24}
\]

Show Whitney how she could have chosen a denominator smaller than 24, and solve the problem.

Multiples of 4: 4, 8, 12, 16, 20, 24
Multiples of 6: 6, 12, 18, 24

\[
\frac{1 \times 3}{4 \times 3} + \frac{1 \times 2}{6 \times 2} = \frac{3}{12} + \frac{2}{12} = \frac{5}{12}
\]

They do have 24 in common, but they also have 12 in common. I could make the common denominator 12 on both.

3. Jackie brought \(\frac{3}{4}\) of a gallon of iced tea to the party. Bill brought \(\frac{7}{8}\) of a gallon of iced tea to the same party. How much iced tea did Jackie and Bill bring to the party?

\[
\text{They brought } \frac{3}{4} + \frac{7}{8} = \frac{3 \times 2}{4 \times 2} + \frac{7}{8} = \frac{6}{8} + \frac{7}{8} = \frac{13}{8} = 1 \frac{5}{8}
\]

4. Madame Curie made some radium in her lab. She used \(\frac{2}{5}\) kg of the radium in an experiment and had \(1\frac{1}{5}\) kg left. How much radium did she have at first?

(Extension: If she performed the experiment twice, how much radium would she have left?)

\[
\text{She had } 1 \frac{13}{20} \text{ kg of radium to begin: } 1 + \frac{5}{20} + \frac{6}{20} = \frac{13}{20}
\]

Extension:

\[
\text{She would have } \frac{11}{20} \text{ kg left.}
\]