S-PA Pre-Algebra Session 19 8/7

1.) $\frac{7}{8} * \frac{12}{21} = \frac{1}{8} * \frac{12}{3} = \frac{1}{2} * \frac{3}{3} = \frac{1}{2} * \frac{1}{1} = \boxed{\frac{1}{2}}$

2.) $4\frac{1}{2} \div \frac{12}{16}$

$4\frac{1}{2} = \frac{(2*4)+1}{2} = \frac{8+1}{2} = \frac{9}{2}$

$\frac{9}{2} \div \frac{12}{16} \rightarrow \frac{9}{2} * \frac{16}{12}$

Keep change Flip.

For multiplication and division, you do not need a common denominator.

$\frac{9}{1} * \frac{8}{12} = \frac{3}{1} * \frac{8}{4} = \frac{3}{1} * \frac{2}{1} = \frac{6}{1} = \boxed{6}$

3.) $\frac{5}{9} \div \frac{15}{27} \rightarrow \frac{5}{9} * \frac{27}{15}$

$\frac{1}{9} * \frac{27}{3} = \frac{1}{1} * \frac{3}{3} = \frac{1}{1} * \frac{1}{1} = \frac{1}{1} = \boxed{1}$

4.) $2\frac{1}{3} * 3\frac{4}{7}$

$3\frac{4}{7} = \frac{(3*7)+4}{7} = \frac{21+4}{7} = \frac{25}{7}$

$2\frac{1}{3} = \frac{(2*3)+1}{3} = \frac{7}{3}$

$\frac{7}{3} * \frac{25}{7} = \frac{1}{3} * \frac{25}{1} = \boxed{\frac{25}{3}}$

Computation

$\frac{3}{4} + \frac{1}{2}$ $\quad \frac{3}{4} + \frac{2}{4} = \frac{5}{4}$

$\frac{3}{4} = \frac{3}{4}$

$\frac{1}{2} = \frac{2}{4}$ (*2)

4: (4), 8, 12, 16, 20...

2: 2, (4), 6, 8, 10, 12, ...

$X + 2\frac{3}{7} = 5\frac{1}{3}$

$-2\frac{3}{7} \quad -2\frac{3}{7}$

$X = 5\frac{1}{3} - 2\frac{3}{7}$

$5\frac{1}{3}$

$-\ 2\frac{3}{7}$

$4\ \frac{7}{21}\ \frac{+21}{21}$

$-\ 2\frac{9}{21}$

$4\frac{28}{21}$

$-\ 2\frac{9}{21}$

$2\frac{19}{21}$

Algebra (opposite!!)

$X - 2 = 3$

$+2 \quad +2$

$X = 5$

$X - \frac{3}{4} = \frac{1}{2}$

$+\frac{3}{4} \quad +\frac{3}{4}$

$X = \frac{3}{4} + \frac{1}{2}$

$X = \frac{3}{4} + \frac{2}{4} = \frac{5}{4}$

$\frac{1}{3} = \frac{7}{21}$ (*7)

$\frac{3}{7} = \frac{9}{21}$ (*3, *3)

3: 3, 6, 9, 12, 15, 18, (21), 24

7: 7, 14, (21)

$X = 2\frac{19}{21}$

$X - \frac{8}{7} = 6\frac{1}{8}$

$+\frac{8}{7} \quad +\frac{8}{7}$

$X = 6\frac{1}{8} + \frac{8}{7}$

$6\frac{1}{8} = 6\frac{7}{56}$ (*7)

$\frac{8}{7} = \frac{64}{56}$ (*8)

$56\overline{)64}$ quotient 1, -56, remainder 8

$\frac{8}{7} = 1\frac{8}{56}$

$6\frac{7}{56}$

$+\ 1\frac{8}{56}$

$7\frac{15}{56}$

1.) $X - 4\frac{1}{5} = 6\frac{7}{8}$

$+4\frac{1}{5} \quad +4\frac{1}{5}$

$X = 6\frac{7}{8} + 4\frac{1}{5}$

$\frac{7}{8} = \frac{35}{40}$ (*5)

$\frac{1}{5} = \frac{8}{40}$ (*8)

$6\frac{7}{8}$

$+\ 4\frac{1}{5}$

$6\frac{35}{40}$

$+\ 4\frac{8}{40}$

$10\frac{43}{40}$

$\frac{43}{40} = 40\overline{)43}$ quotient 1, -40, remainder 3

$10\frac{43}{40} + 10 + 1\frac{3}{40} = \boxed{11\frac{3}{40}}$

2.) $X + \frac{8}{9} = 3\frac{1}{7}$

$-\frac{8}{9} \quad -\frac{8}{9}$

$X = 3\frac{1}{7} - \frac{8}{9}$

$\frac{1}{7} = \frac{9}{63}$ (*9)

$\frac{8}{9} = \frac{56}{63}$ (*7)

$X = 3\frac{9}{63} - \frac{56}{63}$

$2\frac{9+63}{63} - \frac{56}{63}$

$2\frac{72}{63} - \frac{56}{63}$

$2\frac{16}{63}$

$\frac{2}{3}X = \frac{7}{8}$

Think: $\frac{2x}{2} = \frac{8}{2}$ ↓ opposite

$X = \frac{8}{2} = 4$

$\frac{2}{3} * X = \frac{7}{8}$ / $\frac{2}{3}$ / $\frac{2}{3}$

Keep, Change, Flip!!

$X = \frac{7}{8} \div \frac{2}{3}$

$\frac{7}{8} * \frac{3}{2} = \boxed{\frac{21}{16}}$

Multiply by the inverse

$\frac{8}{1} * \frac{1}{8} X = \frac{12}{17} * \frac{8}{1}$

$X = \frac{12}{17} * \frac{8}{1} = \boxed{\frac{96}{17}}$

$1\frac{4}{5} X = \frac{7}{11}$

$1\frac{4}{5} \rightarrow \frac{(1*5)+4}{5} = \frac{9}{5}$

mixed number → improper fraction

$\frac{9}{5} X = \frac{7}{11}$ / $\frac{9}{5}$ / $\frac{9}{5}$

$X = \frac{7}{11} \div \frac{9}{5}$

Keep Change Flip → Inverse

$\frac{7}{11} * \frac{5}{9}$

$\frac{5}{9} * \frac{9}{5} X = \frac{7}{11} * \frac{5}{9}$

$= \boxed{\frac{35}{99}}$

$\frac{5}{3} * \frac{3}{5} X = 2\frac{7}{8} * \frac{5}{3}$

Inverse of $\frac{3}{5} \rightarrow \frac{5}{3}$

$X = 2\frac{7}{8} * \frac{5}{3}$

$\frac{23}{8} * \frac{5}{3} = \boxed{\frac{115}{24}}$

$\frac{(2*8)+7}{8} = \frac{23}{8}$

inverse of number in front of X

$\frac{3}{2}\left(\frac{2}{3}X\right) = \left(\frac{5}{1}\right) \cdot \frac{3}{2} = \boxed{\frac{15}{2}}$

Multiply by the inverse

$\frac{7}{8}\left(\frac{8}{7}X\right) = \left(\frac{4}{1}\right) * \frac{7}{8} = \frac{28 \div 4}{8 \div 4} = \boxed{\frac{7}{2}}$

$\frac{9}{5}\left(\frac{5}{9}X\right) = (10)\frac{9}{5}$

$X = \frac{10}{1} * \frac{9}{5} = \frac{2}{1} * \frac{9}{1} = \frac{18}{1} = \boxed{18}$

(÷5 on 10, ÷5 on 5)

1.) $\frac{8}{1}\left(\frac{1}{8}x\right) = \left(\frac{7}{1}\right)\frac{8}{1}$

2.) $\frac{7}{2}\cdot\frac{2}{7}x = \left(\frac{3}{1}\right)\frac{2}{2}$

3.) $\frac{11}{12}\left(\frac{12}{11}x\right) = \left(\frac{3}{1}\right)\frac{11}{12}$

4.) $\frac{7}{3}\left(\frac{3}{7}x\right) = \left(\frac{14}{1}\right)\frac{7}{3}$