

## SKILL 17

#1  $\frac{5}{9} + \frac{2}{9} = \frac{7}{9}$

#2  $\frac{1}{5} + \frac{4}{5} = \frac{5}{5} = 1$

#3  $\frac{11}{20} + \frac{5}{20} = \frac{16}{20} = \frac{8}{10} = \frac{4}{5}$

#4  $\frac{2}{5} + \frac{1}{10} + \frac{4}{5} = \frac{7}{5}$  OR  $1\frac{2}{5}$

#5  $\frac{3}{7} + \frac{5}{7} + \frac{6}{7} = \frac{14}{7} = \frac{2}{1} = 2$

#6  $\frac{13}{100} + \frac{3}{100} + \frac{9}{100} = \frac{25}{100} = \frac{1}{4}$

#7  $\frac{11}{15} - \frac{8}{15} = \frac{3}{15} = \frac{1}{5}$

#8  $\frac{11}{12} - \frac{5}{12} = \frac{6}{12} = \frac{1}{2}$

#9  $\frac{23}{24} - \frac{11}{24} = \frac{12}{24} = \frac{1}{2}$

#10  $\frac{7}{8} - \frac{3}{8} = \frac{4}{8} = \frac{1}{2}$

#11  $\frac{9}{10} - \frac{3}{10} = \frac{6}{10} = \frac{3}{5}$

#13  $\frac{91}{100} - \frac{31}{100} = \frac{60}{100} = \frac{6}{10} = \frac{3}{5}$

#12  $\frac{29}{50} - \frac{9}{50} = \frac{20}{50} = \frac{2}{5}$

#15  $\frac{3}{16} + \frac{3}{8} =$   
LCM(16, 8) = 16  
GREATER 16 0 16  
8  $\frac{2}{2}$

$\frac{3}{16} + \frac{3}{8} \cdot \frac{2}{2}$

$\frac{3}{16} + \frac{6}{16} = \frac{9}{16}$

#14  $\frac{6}{6} - \frac{1}{6} = \frac{5}{6} = \frac{2}{3}$

#16  $\frac{7}{20} + \frac{3}{4} \cdot \frac{5}{5}$   
LCM(20, 4) = 20

$\frac{7}{20} + \frac{15}{20} = \frac{22}{20} = \frac{11}{10}$  OR  $1\frac{1}{10}$

#17  $\frac{4}{9} \cdot \frac{7}{9} + \frac{11}{12} \cdot \frac{3}{3}$   
LCM(9, 12) = 36  
9  $\frac{4}{9}$   $\frac{7}{9}$   $\frac{11}{12}$   $\frac{3}{3}$   
12 0 12 24 36  
3

$\frac{28}{36} + \frac{33}{36} = \frac{61}{36}$  OR  $1\frac{25}{36}$

#18  $\frac{6}{6} \cdot \frac{3}{4} + \frac{4}{4} \cdot \frac{1}{6} + \frac{5}{8} \cdot \frac{3}{3}$

$\frac{18}{24} + \frac{4}{24} + \frac{15}{24}$

$\frac{37}{24}$  OR  $1\frac{13}{24}$

LCM(4, 6, 8)

4 Y Y Y = 6

6 N N Y = 4

GREATER 8 0 8 16 24  
3

SKILL 17

$$\underline{\underline{\#19}} \quad \frac{9}{9} \cdot \frac{3}{10} + \frac{2}{2} \cdot \frac{7}{45} + \frac{11}{90}$$

$$\text{LCM}(10, 45, 90) = 90$$

$$\frac{27}{90} + \frac{14}{90} + \frac{11}{90}$$

$$\frac{52}{90} = \frac{26}{45}$$

$$\underline{\underline{\#20}} \quad \frac{9}{9} \cdot \frac{1}{2} + \frac{3}{3} \cdot \frac{5}{6} + \frac{2}{2} \cdot \frac{4}{9}$$

$$\underline{\underline{\#21}} \quad \frac{3}{3} \cdot \frac{6}{7} - \frac{1}{3} \cdot \frac{7}{7}$$

$$\frac{9}{18} + \frac{15}{18} + \frac{8}{18}$$

$$\frac{18}{21} - \frac{7}{21}$$

$$\frac{32}{18} = \frac{16}{9} \text{ or } 1\frac{7}{9}$$

$$\frac{11}{21}$$

$$\underline{\underline{\#22}} \quad \frac{8}{8} \cdot \frac{4}{5} - \frac{3}{8} \cdot \frac{5}{5}$$

$$\underline{\underline{\#23}} \quad \frac{3}{3} \cdot \frac{9}{10} - \frac{7}{15} \cdot \frac{2}{2}$$

$$\frac{32}{40} - \frac{15}{40}$$

$$\frac{27}{30} - \frac{14}{30}$$

$$\frac{17}{40}$$

$$\frac{13}{30}$$

$$\underline{\underline{\#24}} \quad \frac{2}{2} \cdot \frac{7}{10} - \frac{1}{4} \cdot \frac{5}{5}$$

$$\underline{\underline{\#25}} \quad \frac{3}{3} \cdot \frac{11}{50} - \frac{1}{30} \cdot \frac{5}{5}$$

$$\frac{14}{20} - \frac{5}{20}$$

$$\frac{33}{150} - \frac{5}{150}$$

$$\frac{9}{20}$$

$$\frac{28}{150} = \frac{14}{75}$$

$$\underline{\underline{\#26}} \quad \frac{4}{4} \cdot \frac{5}{6} - \frac{5}{8} \cdot \frac{3}{3}$$

LCM(6, 8)

$$\frac{28 \div 2}{150 \div 2} = \frac{14}{75}$$

$$\frac{20}{24} - \frac{15}{24}$$



$$\frac{5}{24}$$

SKILL 18

$$\begin{array}{r} \#1 \\ \hline 5 \frac{7}{11} + 2 \frac{3}{11} \\ 7 \frac{10}{11} \end{array}$$

$$\begin{array}{r} \#2 \\ \hline 8 + 3 \frac{1}{7} \\ 11 \frac{1}{7} \end{array}$$

$$\begin{array}{r} \#3 \\ \hline 6 \frac{5}{9} + 11 \\ 17 \frac{5}{9} \end{array}$$

$$\begin{array}{r} \#4 \\ \hline 14 \frac{3}{8} + 5 \frac{5}{8} \\ 19 \frac{8}{8} \\ 20 \end{array}$$

$$\begin{array}{r} \#5 \\ \hline 19 \frac{5}{12} + 3 \frac{11}{12} \\ 22 \frac{16}{12} \\ 23 \frac{4}{12} \\ 23 \frac{1}{3} \end{array}$$

$$\begin{array}{r} \#6 \\ \hline 13 \frac{5}{16} + 7 \frac{15}{16} \\ 20 \frac{20}{16} \\ 21 \frac{4}{16} \\ 21 \frac{1}{4} \end{array}$$

$$\begin{array}{r} \#7 \\ \hline 23 \frac{26}{45} \\ + 15 \frac{7}{45} \\ \hline 38 \frac{33}{45} \\ 38 \frac{11}{15} \end{array}$$

$$\begin{array}{r} \#8 \\ \hline 16 \frac{21}{40} + 18 \frac{29}{40} = 34 \frac{50}{40} = 35 \frac{10}{40} \\ = 35 \frac{1}{4} \end{array}$$

$$\begin{array}{r} \#9 \\ \hline 9 \frac{7}{10} + 2 \frac{9}{10} = 11 \frac{16}{10} = 12 \frac{6}{10} = 12 \frac{3}{5} \end{array}$$

$$\begin{array}{r} \#10 \\ \hline 7 \frac{1}{2} \cdot \frac{2}{2} + 5 \frac{3}{4} \\ 12 \frac{5}{4} = 13 \frac{1}{4} \end{array}$$

$$\begin{array}{r} \#11 \\ \hline 9 \frac{7}{10} \cdot \frac{2}{2} + 16 \frac{1}{4} \cdot \frac{5}{5} \\ 9 \frac{14}{20} + 16 \frac{5}{20} = 25 \frac{19}{20} \end{array}$$

$$\begin{array}{r} \#12 \\ \hline 13 \frac{5}{8} \cdot \frac{3}{3} + 7 \frac{5}{6} \cdot \frac{4}{4} \\ 13 \frac{15}{24} + 7 \frac{20}{24} \\ 20 \frac{35}{24} \\ 21 \frac{11}{24} \end{array}$$

$$\begin{array}{r} \#13 \\ \hline 14 \frac{7}{12} \cdot \frac{3}{3} + 5 \frac{2}{9} \cdot \frac{4}{4} \\ 14 \frac{21}{36} + 5 \frac{8}{36} \\ 19 \frac{29}{36} \end{array}$$

$$\begin{array}{r} \#14 \\ \hline 10 \frac{3}{7} \cdot \frac{3}{3} + 6 \frac{1}{3} \cdot \frac{7}{7} \\ 10 \frac{9}{21} + 6 \frac{7}{21} = 16 \frac{16}{21} \end{array}$$

SKILL 18

$$\#15 \quad 12 \frac{9}{10} + 4 \frac{2}{5} \cdot \frac{2}{2}$$

$$12 \frac{9}{10} + 4 \frac{4}{10}$$

$$16 \frac{13}{10} = 17 \frac{3}{10}$$

$$\#17 \quad 4 \frac{7}{8} + 25 \frac{3}{4} \cdot \frac{2}{2}$$

$$4 \frac{7}{8} + 25 \frac{6}{8}$$

$$29 \frac{13}{8} = 30 \frac{5}{8}$$

$$\#19 \quad 13 \frac{5}{12} + 17 \frac{5}{6} \cdot \frac{2}{2}$$

$$13 \frac{5}{12} + 17 \frac{10}{12}$$

$$30 \frac{15}{12} = 31 \frac{3}{12} = 31 \frac{1}{4}$$

$$\#21 \quad 42 \frac{11}{15} \cdot \frac{4}{4} + 40 \frac{7}{12} \cdot \frac{5}{5}$$

$$42 \frac{44}{60} + 40 \frac{35}{60}$$

$$82 \frac{79}{60} = 83 \frac{19}{60}$$

$$\#23 \quad 35 \frac{5}{6} \cdot \frac{4}{4} + 15 \frac{1}{8} \cdot \frac{3}{3}$$

$$35 \frac{20}{24} + 15 \frac{3}{24} = 50 \frac{23}{24}$$

$$\#25 \quad 21 \frac{4}{5} + 18 \frac{3}{5} + 6 \frac{1}{5}$$

$$45 \frac{8}{5} = 46 \frac{3}{5}$$

$$\#27 \quad 10 \frac{1}{4} \cdot \frac{6}{6} + 8 \frac{1}{3} \cdot \frac{8}{8} + 7 \frac{3}{8} \cdot \frac{3}{3}$$

$$10 \frac{6}{24} + 8 \frac{8}{24} + 7 \frac{9}{24}$$

$$25 \frac{23}{24}$$

$$\#16 \quad 18 \frac{1}{6} \cdot \frac{3}{3} + 26 \frac{5}{9} \cdot \frac{2}{2}$$

$$18 \frac{3}{18} + 26 \frac{10}{18}$$

$$44 \frac{13}{18}$$

$$\#18 \quad 3 \frac{5}{8} \cdot \frac{3}{3} + 2 \frac{7}{12} \cdot \frac{2}{2}$$

$$3 \frac{15}{24} + 2 \frac{14}{24}$$

$$5 \frac{29}{24} = 6 \frac{5}{24}$$

$$\#20 \quad 27 \frac{9}{10} \cdot \frac{4}{4} + 16 \frac{7}{45} \cdot \frac{2}{2}$$

$$27 \frac{81}{90} + 16 \frac{14}{90}$$

$$43 \frac{95}{90} = 44 \frac{5}{90} = 44 \frac{1}{18}$$

$$\#22 \quad 9 \frac{91}{100} + 3 \frac{21}{25} \cdot \frac{4}{4}$$

$$9 \frac{91}{100} + 3 \frac{84}{100}$$

$$12 \frac{175}{100} = 13 \frac{75}{100} = 13 \frac{3}{4}$$

$$\#24 \quad 12 \frac{11}{32} + 4 \frac{15}{32} + 5 \frac{13}{32}$$

$$21 \frac{39}{32} = 22 \frac{7}{32}$$

$$\#26 \quad 15 \frac{13}{20} \cdot \frac{3}{3} + 6 \frac{1}{3} \cdot \frac{20}{20} + 7 \frac{2}{5} \cdot \frac{12}{12}$$

$$15 \frac{39}{60} + 6 \frac{20}{60} + 7 \frac{24}{60}$$

$$28 \frac{83}{60} = 29 \frac{23}{60}$$

$$\#28 \quad 19 \frac{3}{10} \cdot \frac{8}{8} + 6 \frac{5}{8} \cdot \frac{10}{10} + 11 \frac{1}{16} \cdot \frac{5}{5}$$

$$19 \frac{24}{80} + 6 \frac{50}{80} + 11 \frac{45}{80}$$

$$36 \frac{119}{80} = 37 \frac{39}{80}$$

SKILL 19

$$\#1 \quad 4 \frac{6}{7} - 2 \frac{1}{7} = 2 \frac{5}{7}$$

$$\#2 \quad 36 \frac{5}{7} - 13 \frac{2}{7} = 23 \frac{3}{7}$$

$$\#3 \quad 21 \frac{19}{32} - 8 \frac{15}{32} = 13 \frac{4}{32} \\ = 13 \frac{1}{8}$$

$$\#4 \quad 8 \frac{3}{4} - 5 \frac{1}{4} = 3 \frac{2}{4} = 3 \frac{1}{2}$$

$$\#5 \quad 6 \frac{7}{8} - 1 \frac{3}{8} = 5 \frac{4}{8} = 5 \frac{1}{2}$$

$$\#6 \quad 14 \frac{13}{20} - 10 \frac{7}{20} = 4 \frac{6}{20} \\ = 4 \frac{3}{10}$$

$$\#7 \quad 8 \frac{3}{4} \cdot \frac{3}{3} - 5 \frac{1}{3} \cdot \frac{4}{4} \\ 8 \frac{9}{12} - 5 \frac{4}{12} = 3 \frac{5}{12}$$

$$\#8 \quad 51 \frac{11}{16} \quad 51 \frac{11}{16} \\ - 36 \frac{1}{8} \cdot \frac{2}{2} \quad \frac{36 \frac{2}{16}}{15 \frac{9}{16}}$$

$$\#9 \quad 26 \frac{7}{8} - 21 \frac{1}{4} \cdot \frac{2}{2} \\ 26 \frac{7}{8} - 21 \frac{2}{8} = 5 \frac{5}{8}$$

$$\#10 \quad 7 \frac{1}{2} \cdot \frac{6}{6} - 5 \frac{5}{12} \\ 7 \frac{6}{12} - 5 \frac{5}{12} \\ 2 \frac{1}{12}$$

$$\#11 \quad 22 \frac{19}{40} - 9 \frac{7}{20} \cdot \frac{2}{2} \\ 22 \frac{19}{40} - 9 \frac{14}{40} \\ 13 \frac{5}{40} = 13 \frac{1}{8}$$

$$\#12 \quad 13 \frac{5}{18} \cdot \frac{2}{2} - 6 \frac{1}{12} \cdot \frac{3}{3} \\ 13 \frac{10}{36} - 6 \frac{3}{36} \\ 7 \frac{7}{36}$$

$$\#13 \quad 25 \frac{5}{7} \cdot \frac{6}{6} - 10 \frac{1}{6} \cdot \frac{7}{7} \\ 25 \frac{30}{42} - 10 \frac{7}{42} \\ 15 \frac{23}{42}$$

$$\#14 \quad 39 \frac{8}{9} \cdot \frac{2}{2} - 30 \frac{5}{18} \\ 39 \frac{16}{18} - 30 \frac{5}{18} \\ 9 \frac{11}{18}$$

SKILL 19

$$\#15 \quad 16 \frac{7}{8} \cdot \frac{5}{5} - 12 \frac{1}{5} \cdot \frac{8}{8}$$

$$16 \frac{35}{40} - 12 \frac{8}{40}$$

$$4 \frac{27}{40}$$

$$\#17 \quad 14 - 10 \frac{3}{10}$$

$$13 \frac{10}{10} - 10 \frac{3}{10}$$

$$3 \frac{7}{10}$$

$$\#19 \quad 19 \frac{5}{16} - 6 \frac{5}{8} \cdot \frac{2}{2}$$

$$19 \frac{5}{16} - 6 \frac{10}{16}$$

$$18 \frac{21}{16} - 6 \frac{10}{16}$$

$$12 \frac{11}{16}$$

$$\#21 \quad 24 \frac{5}{6} \cdot \frac{2}{2} - 10 \frac{11}{12}$$

$$24 \frac{10}{12} - 10 \frac{11}{12}$$

$$23 \frac{22}{12} - 10 \frac{11}{12}$$

$$13 \frac{11}{12}$$

$$\#23 \quad 6 \frac{3}{4} - 3 \frac{5}{4} \cdot \frac{2}{2}$$

$$6 \frac{3}{4} - 3 \frac{10}{4}$$

$$5 \frac{7}{4} - 3 \frac{10}{4}$$

$$2 \frac{7}{4}$$

$$2 \frac{1}{2}$$

$$\#16 \quad 9 \frac{11}{20} \cdot \frac{2}{2} - 7 \frac{3}{8} \cdot \frac{5}{5}$$

$$9 \frac{22}{40} - 7 \frac{15}{40}$$

$$2 \frac{7}{40}$$

$$\#18 \quad 6 - 2 \frac{5}{8}$$

$$5 \frac{8}{8} - 2 \frac{5}{8}$$

$$3 \frac{3}{8}$$

$$\#20 \quad 6 \frac{2}{9} - 4 \frac{2}{3} \cdot \frac{3}{3}$$

$$6 \frac{2}{9} - 4 \frac{6}{9}$$

$$5 \frac{11}{9} - 4 \frac{6}{9}$$

$$1 \frac{5}{9}$$

$$\#22 \quad 11 \frac{3}{10} \cdot \frac{2}{2} - 7 \frac{11}{15} \cdot \frac{2}{2}$$

$$11 \frac{6}{30} - 7 \frac{22}{30}$$

$$10 \frac{39}{30} - 7 \frac{22}{30}$$

$$3 \frac{17}{30}$$

$$\#24 \quad 4 \frac{3}{20} \cdot \frac{3}{3} - 1 \frac{11}{15} \cdot \frac{4}{4}$$

$$4 \frac{9}{60} - 1 \frac{44}{60}$$

$$3 \frac{69}{60} - 1 \frac{44}{60}$$

$$2 \frac{25}{60}$$

$$2 \frac{5}{12}$$

SKILL 20

$$\#1 \quad \frac{-1}{3} \times \frac{2}{5} = \frac{-2}{15}$$

$$\#2 \quad \frac{1}{7} \times \frac{2}{9} = \frac{2}{63}$$

$$\#3 \quad \frac{-1}{2} \times \frac{3}{22} = \frac{-3}{44}$$

$$\#4 \quad \frac{-2}{3} \times \frac{3}{4} = \frac{-6}{4} = -\frac{3}{2}$$

$$\#5 \quad \frac{-10}{6} \times \frac{2}{-1} = \frac{20}{-6} = -\frac{10}{3}$$

$$\#6 \quad \frac{1}{4} \times \frac{5}{9} = \frac{5}{36}$$

$$\#7 \quad \frac{-1}{6} \times \frac{-1}{3} = \frac{1}{18}$$

$$\#8 \quad \frac{-5}{4} \times \frac{-1}{3} = \frac{5}{12}$$

$$\#9 \quad \frac{-1}{4} \times \frac{5}{3} = \frac{-5}{12}$$

$$\#10 \quad \frac{-2}{-1} \times \frac{7}{-1} = \frac{14}{-1} = -14$$

$$\#11 \quad \frac{-4}{-1} \times \frac{5}{-1} = \frac{20}{-1} = -20$$

$$\#12 \quad \frac{-1}{-1} \times \frac{3}{20} = \frac{3}{20}$$

$$\#13 \quad \frac{10}{-2} \times \frac{7}{5} = \frac{-70}{5} = -14$$

$$\#14 \quad \frac{1}{9} \times \frac{2}{10} = \frac{2}{90} = \frac{1}{45}$$

$$\#15 \quad \frac{5}{3} \times \frac{1}{8} = \frac{5}{24}$$

$$\#16 \quad \frac{5}{-1} \times \frac{1}{2} = \frac{-5}{2}$$

Skill 21

#11  
 $\frac{-1}{5} \div \frac{-1}{10} = \frac{-1}{5} \times \frac{10}{-1} = \frac{10}{5} = 2$

#12  
 $\frac{1}{9} \div \frac{-1}{2} = \frac{1}{9} \times \frac{2}{-1} = \frac{2}{-9} = -\frac{2}{9}$

#13  
 $\frac{7}{16} \div \frac{9}{7} = \frac{7}{16} \times \frac{7}{9} = \frac{49}{144}$

#14  
 $8 \div \frac{5}{7} = 8 \times \frac{7}{5} = \frac{56}{5}$

#15  
 $\frac{1}{10} \div \frac{2}{3} = \frac{1}{10} \times \frac{3}{2} = \frac{3}{20}$

#16  
 $\frac{10}{3} \div \frac{25}{26} = \frac{10}{3} \times \frac{26}{25} = \frac{260}{75} = \frac{52}{15}$

#17  
 $\frac{1}{2} \div \frac{9}{10} = \frac{1}{2} \times \frac{10}{9} = \frac{10}{18} = \frac{5}{9}$

#18  
 $\frac{1}{5} \div \frac{10}{9} = \frac{1}{5} \times \frac{9}{10} = \frac{9}{50}$

#19  
 $\frac{3}{8} \div \frac{1}{7} = \frac{3}{8} \times \frac{7}{1} = \frac{21}{8}$

#20  
 $2 \frac{5}{7} \div \frac{2}{5} = \frac{19}{7} \times \frac{5}{2} = \frac{95}{14} = 6 \frac{11}{14}$

#21  
 $1 \frac{11}{9} \div 7 \frac{1}{2} = \frac{20}{9} \div \frac{15}{2} = \frac{20}{9} \times \frac{2}{15} = \frac{40}{135} = \frac{8}{27}$

#22  
 $35 \div \frac{7}{10} = 35 \times \frac{10}{7} = 50$