

12F

- 1) $\frac{18}{63} + \frac{9}{9} = \frac{2}{7}$
- 2) $\frac{26}{32} + \frac{2}{2} = \frac{13}{16}$
- 3) $\frac{42}{48} + \frac{6}{6} = \frac{7}{8}$
- 4) yes
- 5) yes
- 6) $\frac{36}{72} + \frac{8}{72} = \frac{44}{72} = \frac{11}{18}$
- 7) $\frac{20}{30} + \frac{6}{30} = \frac{26}{30} = \frac{13}{15}$
- 8) $\frac{12}{42} + \frac{6}{6} = \frac{2}{7}$
- 9) $\frac{4}{20} + \frac{4}{4} = \frac{1}{5}$
- 10) $\frac{8}{32} + \frac{28}{32} = \frac{8+28}{32} = \frac{36}{32} = \frac{9}{8}$
- 11) $\frac{18}{36} + \frac{24}{36} = \frac{18+24}{36} = \frac{42}{36} = \frac{7}{6}$
- 12) 90,524
- 13) 1,110,420
- 14) 2,595,915
- 15) $\frac{18}{30} + \frac{6}{6} = \frac{3}{5}$
500 ÷ 5 = 100; 100 × 3 = 300
- 16) $\frac{16}{60} > \frac{15}{60}$ more sopranos
- 17) 16 × 12 = 192; 192 ÷ 3 = 64
- 18) 3/4 of 64 = \$48
- 19) $\frac{12}{18} + \frac{6}{18} = \frac{12+6}{18} = \frac{18}{18} = 1$
- 20) $\frac{1}{3} + \frac{4}{1} = \frac{1}{3} + \frac{12}{3} = \frac{13}{3}$

13A

- 1) done
- 2) $\begin{array}{c} 45 \\ / \quad \backslash \\ 3 \quad 15 \\ \quad / \quad \backslash \\ \quad 3 \quad 5 \end{array}$
- 3) $\begin{array}{c} 30 \\ / \quad \backslash \\ 2 \quad 15 \\ \quad / \quad \backslash \\ \quad 3 \quad 5 \end{array}$
- 4) done
- 5) 3 × 3 × 3
- 6) 2 × 5 × 5
- 7) done
- 8) $\frac{20}{28} = \frac{2 \times 2 \times 5}{2 \times 2 \times 7} = \frac{2}{2} \times \frac{2}{2} \times \frac{5}{7} = \frac{5}{7}$
- 9) $\frac{30}{50} = \frac{2 \times 3 \times 5}{2 \times 5 \times 5} = \frac{2}{2} \times \frac{3}{5} \times \frac{5}{5} = \frac{3}{5}$
- 10) $\frac{21}{33} = \frac{3 \times 7}{3 \times 11} = \frac{3}{3} \times \frac{7}{11} = \frac{7}{11}$
- 11) $\frac{18}{26} = \frac{2 \times 3 \times 3}{2 \times 13} = \frac{2}{2} \times \frac{3 \times 3}{13} = \frac{9}{13}$
- 12) $\frac{24}{54} = \frac{2 \times 2 \times 2 \times 3}{2 \times 3 \times 3 \times 3} = \frac{2}{2} \times \frac{3}{3} \times \frac{2 \times 2}{3 \times 3} = \frac{4}{9}$

13B

- 1) $\begin{array}{c} 100 \\ / \quad \backslash \\ 2 \quad 50 \\ \quad / \quad \backslash \\ \quad 2 \quad 25 \\ \quad \quad / \quad \backslash \\ \quad \quad 5 \quad 5 \end{array}$
- 2) $\begin{array}{c} 32 \\ / \quad \backslash \\ 2 \quad 16 \\ \quad / \quad \backslash \\ \quad 2 \quad 8 \\ \quad \quad / \quad \backslash \\ \quad \quad 2 \quad 4 \\ \quad \quad \quad / \quad \backslash \\ \quad \quad \quad 2 \quad 2 \end{array}$
- 3) $\begin{array}{c} 72 \\ / \quad \backslash \\ 2 \quad 36 \\ \quad / \quad \backslash \\ \quad 2 \quad 18 \\ \quad \quad / \quad \backslash \\ \quad \quad 2 \quad 9 \\ \quad \quad \quad / \quad \backslash \\ \quad \quad \quad 3 \quad 3 \end{array}$
- 4) 2 × 2 × 2 × 2 × 2 × 3
- 5) 2 × 2 × 7
- 6) 2 × 3 × 7
- 7) $\frac{45}{75} = \frac{3 \times 3 \times 5}{3 \times 5 \times 5} = \frac{3}{3} \times \frac{5}{5} \times \frac{3}{5} = \frac{3}{5}$
- 8) $\frac{42}{60} = \frac{2 \times 3 \times 7}{2 \times 2 \times 3 \times 5} = \frac{2}{2} \times \frac{3}{3} \times \frac{7}{2 \times 5} = \frac{7}{10}$
- 9) done
- 10) $\frac{33}{44} = \frac{3 \times 11}{2 \times 2 \times 11} = \frac{3}{4}$
- 11) $\frac{40}{90} = \frac{2 \times 2 \times 2 \times 5}{2 \times 3 \times 3 \times 5} = \frac{4}{9}$
- 12) $\frac{27}{48} = \frac{3 \times 3 \times 3}{2 \times 2 \times 2 \times 2 \times 3} = \frac{9}{16}$

13C

- 1) $\begin{array}{c} 20 \\ / \quad \backslash \\ 2 \quad 10 \\ \quad / \quad \backslash \\ \quad 2 \quad 5 \end{array}$
- 2) $\begin{array}{c} 81 \\ / \quad \backslash \\ 3 \quad 27 \\ \quad / \quad \backslash \\ \quad 3 \quad 9 \\ \quad \quad / \quad \backslash \\ \quad \quad 3 \quad 3 \end{array}$
- 3) $\begin{array}{c} 52 \\ / \quad \backslash \\ 2 \quad 26 \\ \quad / \quad \backslash \\ \quad 2 \quad 13 \end{array}$
- 4) 2 × 3 × 11
- 5) 2 × 2 × 11
- 6) 2 × 2 × 2 × 2 × 5
- 7) $\frac{20}{24} = \frac{2 \times 2 \times 5}{2 \times 2 \times 2 \times 3} = \frac{5}{6}$
- 8) $\frac{30}{36} = \frac{2 \times 3 \times 5}{2 \times 2 \times 3 \times 3} = \frac{5}{6}$
- 9) $\frac{48}{54} = \frac{2 \times 2 \times 2 \times 2 \times 3}{2 \times 3 \times 3 \times 3} = \frac{8}{9}$
- 10) $\frac{9}{27} = \frac{3 \times 3}{3 \times 3 \times 3} = \frac{1}{3}$
- 11) $\frac{15}{25} = \frac{3 \times 5}{5 \times 5} = \frac{3}{5}$
- 12) $\frac{12}{15} = \frac{2 \times 2 \times 3}{3 \times 5} = \frac{4}{5}$

13D

- 1) 2×13
- 2) $2 \times 2 \times 3 \times 5$
- 3) $2 \times 2 \times 2 \times 3$
- 4) $\frac{18}{24} = \frac{\cancel{2} \times \cancel{3} \times 3}{\cancel{2} \times 2 \times 2 \times \cancel{3}} = \frac{3}{4}$
- 5) $\frac{15}{30} = \frac{\cancel{3} \times 5}{2 \times \cancel{3} \times 5} = \frac{1}{2}$
- 6) $\frac{8}{32} + \frac{8}{32} = \frac{16}{32} + \frac{16}{16} = \frac{1}{2}$
- 7) $\frac{10}{16} - \frac{8}{16} = \frac{2}{16} + \frac{2}{2} = \frac{1}{8}$
- 8) $\frac{6}{21} + \frac{7}{21} = \frac{13}{21}$
- 9) $\frac{2}{12} + \frac{6}{12} = \frac{2+6}{1} = \frac{2}{6} + \frac{2}{2} = \frac{1}{3}$
- 10) $\frac{5}{9} \times \frac{3}{7} = \frac{15}{63} + \frac{3}{3} = \frac{5}{21}$
- 11) $\frac{8}{11} \times \frac{3}{4} = \frac{24}{44} + \frac{4}{4} = \frac{6}{11}$
- 12) done
- 13) $178 \frac{8}{53}$
- 14) $26 \frac{11}{189}$
- 15) $1/6 \times 12 = 2$
- 16) $\frac{3}{4} + \frac{1}{8} = \frac{24}{32} + \frac{4}{32} = \frac{28}{32} + \frac{4}{4} = \frac{7}{8}$
- 17) $2,845 \div 5 = 569$
- 18) $528 \times 73 = 38,544$

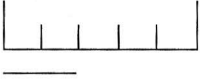
13E

- 1) $3 \times 3 \times 3 \times 3$
- 2) $2 \times 3 \times 3 \times 5$
- 3) $3 \times 5 \times 5$
- 4) $\frac{8}{22} = \frac{\cancel{2} \times 2 \times 2}{\cancel{2} \times 11} = \frac{4}{11}$
- 5) $\frac{32}{48} = \frac{\cancel{2} \times \cancel{2} \times \cancel{2} \times \cancel{2} \times 2}{\cancel{2} \times \cancel{2} \times \cancel{2} \times \cancel{2} \times 3} = \frac{2}{3}$
- 6) $\frac{6}{12} + \frac{4}{12} = \frac{10}{12} + \frac{2}{2} = \frac{5}{6}$
- 7) $\frac{18}{27} - \frac{9}{27} = \frac{9}{27} + \frac{9}{9} = \frac{1}{3}$
- 8) $\frac{30}{50} + \frac{5}{50} = \frac{35}{50} + \frac{5}{5} = \frac{7}{10}$
- 9) $\frac{16}{64} + \frac{48}{64} = \frac{16+48}{1} = \frac{16}{48} + \frac{16}{16} = \frac{1}{3}$
- 10) $\frac{5}{9} \times \frac{2}{6} = \frac{10}{54} + \frac{2}{2} = \frac{5}{27}$
- 11) $\frac{2}{5} \times \frac{3}{4} = \frac{6}{20} + \frac{2}{2} = \frac{3}{10}$
- 12) $\frac{30}{48} < \frac{32}{48}$
- 13) $\frac{7}{21} > \frac{6}{21}$
- 14) $\frac{40}{80} = \frac{40}{80}$
- 15) $29 \frac{28}{38}$ or $29 \frac{14}{19}$
- 16) $122 \frac{2}{22}$ or $122 \frac{1}{11}$
- 17) $21 \frac{97}{235}$
- 18) $45 \times 365 = 16,425$
- 19) $\frac{12}{36} + \frac{15}{36} = \frac{27}{36}$
- 20) $\frac{27}{36}$ of 60: $\frac{27}{36} \times \frac{60}{1} = \frac{1,620}{36} = 45$ min.
 $3/4$ of 60: $60 \div 4 = 15$; $15 \times 3 = 45$
 The reduced fraction is easier to use.

13F

- 1) $2 \times 2 \times 2 \times 2 \times 2 \times 2$
- 2) $2 \times 2 \times 2 \times 2$
- 3) $3 \times 3 \times 5$
- 4) $\frac{81}{90} = \frac{\cancel{3} \times \cancel{3} \times 3 \times 3}{2 \times \cancel{3} \times \cancel{3} \times 5} = \frac{9}{10}$
- 5) $\frac{12}{18} = \frac{\cancel{2} \times 2 \times \cancel{3}}{\cancel{2} \times \cancel{3} \times 3} = \frac{2}{3}$
- 6) $\frac{18}{48} + \frac{8}{48} = \frac{26}{48} + \frac{2}{2} = \frac{13}{24}$
- 7) $\frac{45}{50} - \frac{20}{50} = \frac{25}{50} + \frac{25}{25} = \frac{1}{2}$
- 8) $\frac{12}{24} + \frac{6}{24} = \frac{18}{24} + \frac{6}{6} = \frac{3}{4}$
- 9) $\frac{10}{50} + \frac{20}{50} = \frac{10+20}{1} = \frac{10}{20} + \frac{10}{10} = \frac{1}{2}$
- 10) $\frac{4}{7} \times \frac{2}{8} = \frac{8}{56} + \frac{8}{8} = \frac{1}{7}$
- 11) $\frac{5}{12} \times \frac{3}{5} = \frac{15}{60} + \frac{15}{15} = \frac{1}{4}$
- 12) $\frac{60}{110} < \frac{77}{110}$
- 13) $\frac{9}{36} < \frac{16}{36}$
- 14) $\frac{15}{36} > \frac{12}{36}$
- 15) $37 \frac{69}{96}$ or $37 \frac{23}{32}$
- 16) $98 \frac{38}{73}$
- 17) $56 \frac{111}{120}$ or $56 \frac{37}{40}$
- 18) $2,075 \div 25 = 83$
- 19) $\frac{6}{18} + \frac{3}{18} = \frac{9}{18} = \frac{1}{2}$
 $\frac{1}{2} + \frac{1}{8} = \frac{8}{16} + \frac{2}{16} = \frac{10}{16} = \frac{5}{8}$
- 20) $\frac{8}{8} - \frac{5}{8} = \frac{3}{8}$

14A

- 1) done
- 2) $\frac{7}{10}$
- 3) $\frac{2}{3}$
- 4) $\frac{3}{7}$
- 5) done
- 6) 
- 7) done
- 8) $\frac{12}{16} = \frac{3}{4}$
- 9) $\frac{8}{16} = \frac{1}{2}$
- 10) $\frac{3}{16}$
- 11) $\frac{14}{16} = \frac{7}{8}$
- 12) $\frac{10}{16} = \frac{5}{8}$