

# Multiplying and Dividing Fractions

Directions: Multiply or Divide and write each answer in simplest form.

$$1. \frac{5}{12} \cdot \frac{3}{20} = \frac{\cancel{5}}{\cancel{12}} \cdot \frac{\cancel{3}}{\cancel{20}} = \frac{1}{2 \cdot 2 \cdot 2 \cdot 2} = \frac{1}{16}$$

$$\begin{array}{c} 12 \\ \wedge \\ 2 \ 6 \\ \wedge \\ 2 \ 3 \end{array} \quad \begin{array}{c} 20 \\ \wedge \\ 2 \ 10 \\ \wedge \\ 2 \ 5 \end{array}$$

$$2. \frac{3}{2} \left(-\frac{8}{9}\right) = \frac{3}{2} \cdot \frac{-8}{9} = \frac{\cancel{3}}{\cancel{2}} \cdot \frac{-\cancel{2} \cdot \cancel{2} \cdot \cancel{2}}{\cancel{3} \cdot 3} = \frac{-2 \cdot 2}{3} = \frac{-4}{3}$$

$$\begin{array}{c} 8 \\ \wedge \\ 2 \ 4 \\ \wedge \\ 2 \ 2 \end{array} \quad \begin{array}{c} 9 \\ \wedge \\ 3 \ 3 \end{array}$$

$$3. -4 \left(\frac{7}{12}\right) = \frac{-4}{1} \cdot \frac{7}{12} = \frac{-\cancel{2} \cdot \cancel{2}}{1} \cdot \frac{7}{\cancel{2} \cdot \cancel{2} \cdot 3} = \frac{-1 \cdot 7}{1 \cdot 3} = \frac{-7}{3}$$

$$\begin{array}{c} 4 \\ \wedge \\ 2 \ 2 \end{array} \quad \begin{array}{c} 12 \\ \wedge \\ 2 \ 6 \\ \wedge \\ 2 \ 3 \end{array}$$

$$4. -1\frac{3}{8} \times 4\frac{2}{7} = \frac{-11}{8} \cdot \frac{30}{7} = \frac{-11}{\cancel{2} \cdot \cancel{2} \cdot \cancel{2}} \cdot \frac{\cancel{2} \cdot 3 \cdot 5}{7} = \frac{-11 \cdot 3 \cdot 5}{2 \cdot 2 \cdot 7} = \frac{-165}{28}$$

$$\begin{array}{c} 8 \\ \wedge \\ 2 \ 4 \\ \wedge \\ 2 \ 2 \end{array} \quad \begin{array}{c} 30 \\ \wedge \\ 5 \ 6 \\ \wedge \\ 2 \ 3 \end{array} \quad \begin{array}{r} 28 \quad \frac{5}{28} \\ \frac{165}{-140} \\ \hline 25 \end{array} \quad = \frac{-165}{28} \text{ or } -5\frac{25}{28}$$

$$5. \frac{-3}{4} \cdot \frac{7}{15} \cdot \frac{3}{5} = \frac{-3}{\cancel{2} \cdot 2} \cdot \frac{-7}{\cancel{3} \cdot 5} \cdot \frac{\cancel{3}}{5} = \frac{-3 \cdot -7}{2 \cdot 2 \cdot 5 \cdot 5} = \frac{21}{100}$$

$$\begin{array}{c} 4 \\ \wedge \\ 2 \ 2 \end{array} \quad \begin{array}{c} 15 \\ \wedge \\ 3 \ 5 \end{array}$$

$$6. 3\left(-\frac{5}{6}\right)2\frac{2}{3} = \frac{3}{1} \cdot \frac{-5}{\cancel{2} \cdot 3} \cdot \frac{8}{3} = \frac{\cancel{3}}{1} \cdot \frac{-5}{\cancel{2} \cdot 3} \cdot \frac{\cancel{2} \cdot 2 \cdot 2}{\cancel{3}} = \frac{-5 \cdot 2 \cdot 2}{3} = \frac{-20}{3} \text{ OR } -6\frac{2}{3}$$

$$\begin{array}{c} 6 \\ \wedge \\ 2 \ 3 \end{array} \quad \begin{array}{c} 8 \\ \wedge \\ 2 \ 4 \\ \wedge \\ 2 \ 2 \end{array} \quad \begin{array}{r} 3 \ \sqrt{20} \\ -18 \\ \hline 2 \end{array}$$

$$7. \frac{8}{3} + \frac{5}{12} \left(-\frac{8}{7}\right) = \frac{5}{\cancel{2} \cdot 3} \cdot \frac{-8}{7} = \frac{5}{\cancel{2} \cdot 3} \cdot \frac{-2 \cdot \cancel{2} \cdot 2}{7} = \frac{5 \cdot -2}{3 \cdot 7} = \frac{-10}{21}$$

$$\frac{8 \cdot 7}{3 \cdot 7} + \frac{-10}{21} = \frac{56}{21} + \frac{-10}{21} = \frac{56 + -10}{21} = \frac{46}{21} \text{ OR } 2\frac{4}{21}$$

3: 3, 6, 9, 12, 15, 18, 21

21: 21

LCD = 21

$$\begin{array}{r} 21 \ \sqrt{46} \\ -42 \\ \hline 4 \end{array}$$

$$8. \frac{-4x}{7} \left( \frac{-3x}{18} \right) = \frac{-4x}{7} \cdot \frac{-3x}{18} = \frac{-\cancel{2} \cdot 2 \cdot x}{7} \cdot \frac{-\cancel{3} x}{\cancel{2} \cdot \cancel{3}} = \frac{-2 \cdot x^{\textcircled{1}} \cdot -1 \cdot x^{\textcircled{1}}}{7 \cdot 3}$$

$$\begin{array}{c} 4 \\ \wedge \\ 2 \ 2 \end{array} \quad \begin{array}{c} 18 \\ \wedge \\ 2 \ 9 \\ \wedge \\ 3 \ 3 \end{array} = \boxed{\frac{2x^2}{21}}$$

$$9. \frac{-7x^5}{12} \cdot \frac{5x}{49} = \frac{-7x^5}{2 \cdot 2 \cdot 3} \cdot \frac{5x}{\cancel{7} \cdot 7} = \frac{-1 \cdot x^{\textcircled{5}} \cdot 5 \cdot x^{\textcircled{1}}}{2 \cdot 2 \cdot 3 \cdot 7} = \boxed{\frac{-5x^6}{84}}$$

$$\begin{array}{c} 12 \\ \wedge \\ 2 \ 6 \\ \wedge \\ 2 \ 3 \end{array} \quad \begin{array}{c} 49 \\ \wedge \\ 7 \ 7 \end{array}$$

$$10. \frac{-8x^2y}{5} \cdot \frac{35xy}{16} = \frac{-\cancel{2} \cdot \cancel{2} \cdot 2x^2y^1}{5} \cdot \frac{\cancel{5} \cdot 7 \cdot x^1 \cdot y^1}{\cancel{2} \cdot \cancel{2} \cdot 2 \cdot 2}$$

$$= \frac{-1 \cdot x^{\textcircled{2}} \cdot y^{\textcircled{1}} \cdot 7 \cdot x^{\textcircled{1}} \cdot y^{\textcircled{1}}}{2} = \boxed{\frac{-7x^3y^2}{2}}$$

$$\begin{array}{c} 8 \\ \wedge \\ 2 \ 4 \\ \wedge \\ 2 \ 2 \end{array} \quad \begin{array}{c} 35 \\ \wedge \\ 5 \ 7 \end{array} \quad \begin{array}{c} 16 \\ \wedge \\ 2 \ 8 \\ \wedge \\ 2 \ 4 \\ \wedge \\ 2 \ 2 \end{array}$$

$$11. -\frac{2}{3} \div \frac{8}{9} = -\frac{2}{3} \cdot \frac{9}{8} = \frac{-2 \cdot \cancel{3} \cdot 3}{\cancel{3} \cdot 2 \cdot 2 \cdot 2} = \frac{-1 \cdot 3}{2 \cdot 2} = \boxed{\frac{-3}{4}}$$

$$\begin{array}{c} 8 \\ \wedge \\ 2 \cdot 4 \\ \wedge \\ 2 \cdot 2 \end{array} \quad \begin{array}{c} 9 \\ \wedge \\ 3 \cdot 3 \end{array}$$

$$12. -1\frac{5}{8} \div 4\frac{7}{12} = \frac{-13}{8} \div \frac{55}{12} = \frac{-13}{8} \cdot \frac{12}{55} = \frac{-13}{\cancel{2} \cdot \cancel{2} \cdot 2} \cdot \frac{\cancel{2} \cdot \cancel{2} \cdot 3}{5 \cdot 11} = \frac{-13 \cdot 3}{2 \cdot 5 \cdot 11}$$

$$\begin{array}{c} 8 \\ \wedge \\ 2 \cdot 4 \\ \wedge \\ 2 \cdot 2 \end{array} \quad \begin{array}{c} 12 \\ \wedge \\ 2 \cdot 6 \\ \wedge \\ 2 \cdot 3 \end{array} \quad \begin{array}{c} 55 \\ \wedge \\ 5 \cdot 11 \end{array} \quad = \boxed{\frac{-39}{110}}$$

$$13. 1\frac{1}{15} \div 12 \cdot 3\frac{1}{4} = \frac{16}{15} \cdot \frac{1}{12} \cdot \frac{13}{4} = \frac{\cancel{2} \cdot \cancel{2} \cdot \cancel{2} \cdot 2}{3 \cdot 5} \cdot \frac{1}{\cancel{2} \cdot \cancel{2} \cdot 3} \cdot \frac{13}{\cancel{2} \cdot 2}$$

$$\begin{array}{c} 16 \\ \wedge \\ 2 \cdot 8 \\ \wedge \\ 2 \cdot 4 \\ \wedge \\ 2 \cdot 2 \end{array} \quad \begin{array}{c} 15 \\ \wedge \\ 3 \cdot 5 \end{array} \quad \begin{array}{c} 12 \\ \wedge \\ 2 \cdot 6 \\ \wedge \\ 2 \cdot 3 \end{array} \quad \begin{array}{c} 4 \\ \wedge \\ 2 \cdot 2 \end{array} \quad = \frac{1 \cdot 13}{3 \cdot 5 \cdot 3} = \boxed{\frac{13}{45}}$$

$$14. \frac{a^3}{2} \div \frac{11}{2a} = \frac{a^3}{\cancel{2}} \cdot \frac{\cancel{2}a}{11} = \frac{a^{\textcircled{3}} \cdot a^{\textcircled{1}}}{11} = \boxed{\frac{a^4}{11}}$$

$$15. -\frac{12m^3}{5} \div \frac{3}{20m^2} = \frac{-12m^3}{5} \cdot \frac{20m^2}{3} = \frac{-\cancel{2} \cdot \cancel{2} \cdot \cancel{3} \cdot m^3}{\cancel{5}} \cdot \frac{\cancel{2} \cdot \cancel{2} \cdot \cancel{5} \cdot m^2}{\cancel{3}}$$

$$= \frac{-\cancel{2} \cdot \cancel{2} \cdot m^{\textcircled{3}} \cdot \cancel{2} \cdot \cancel{2} \cdot m^{\textcircled{2}}}{1}$$

$$= \boxed{-16m^5}$$

$\begin{array}{c} 12 \\ \wedge \\ 2 \ 6 \\ \wedge \\ 2 \ 3 \end{array}$

$\begin{array}{c} 20 \\ \wedge \\ 2 \ 10 \\ \wedge \\ 2 \ 5 \end{array}$