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5-10 Dividing Mixed Numbers - Practice and Problem Solving

Divide. Write in simplest form.

7. $4\frac{1}{6} \div 10$

$$4\frac{1}{6} \div 10 = \frac{25}{6} \div \frac{10}{1}$$
$$= \frac{25}{6} \times \frac{1}{10}$$
$$= \frac{\overset{5}{\cancel{25}} \times 1}{6 \times \underset{2}{\cancel{10}}}$$
$$= \frac{5}{12}$$

9. $6 \div 2\frac{1}{4}$

$$6 \div 2\frac{1}{4} = \frac{6}{1} \div \frac{9}{4}$$
$$= \frac{6}{1} \times \frac{4}{9}$$
$$= \frac{\overset{2}{\cancel{6}} \times 4}{1 \times \underset{3}{\cancel{9}}}$$
$$= \frac{8}{3} \text{ or } 2\frac{2}{3}$$

11. $7\frac{4}{5} \div \frac{1}{5}$

$$7\frac{4}{5} \div \frac{1}{5} = \frac{39}{5} \div \frac{1}{5}$$
$$= \frac{39}{5} \times \frac{5}{1}$$
$$= \frac{39 \times \overset{1}{\cancel{5}}}{\underset{1}{\cancel{5}} \times 1}$$
$$= \frac{39}{1} \text{ or } 39$$

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13. $8\frac{3}{4} \div 2\frac{1}{6}$

$$8\frac{3}{4} \div 2\frac{1}{6} = \frac{35}{4} \div \frac{13}{6}$$
$$= \frac{35}{4} \times \frac{6}{13}$$
$$= \frac{35 \times \overset{3}{\cancel{6}}}{\underset{2}{\cancel{4}} \times 13}$$
$$= \frac{105}{26} \text{ or } 4\frac{1}{26}$$

15. $3\frac{3}{4} \div 5\frac{5}{8}$

$$3\frac{3}{4} \div 5\frac{5}{8} = \frac{15}{4} \div \frac{45}{8}$$
$$= \frac{15}{4} \times \frac{8}{45}$$
$$= \frac{\overset{1}{\cancel{15}} \times \overset{2}{\cancel{8}}}{\underset{1}{\cancel{4}} \times \underset{3}{\cancel{45}}}$$
$$= \frac{2}{3}$$

17. $6\frac{3}{5} \div 2\frac{3}{4}$

$$6\frac{3}{5} \div 2\frac{3}{4} = \frac{33}{5} \div \frac{11}{4}$$
$$= \frac{33}{5} \times \frac{4}{11}$$
$$= \frac{\overset{3}{\cancel{33}} \times 4}{5 \times \underset{1}{\cancel{11}}}$$
$$= \frac{12}{5} \text{ or } 2\frac{2}{5}$$

ALGEBRA Evaluate each expression if $a = 4\frac{4}{5}$, $b = \frac{2}{3}$, $c = 6$, and $d = 1\frac{1}{2}$.

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19. $b \div 1\frac{2}{9}$

$$b \div 1\frac{2}{9} = \frac{2}{3} \div \frac{11}{9}$$
$$= \frac{2}{3} \times \frac{9}{11}$$
$$= \frac{2 \times \cancel{9}^{3}}{\cancel{3}_{1} \times 11}$$
$$= \frac{6}{11}$$

21. $a \div c$

$$a \div c = 4\frac{4}{5} \div 6$$
$$= \frac{24}{5} \div \frac{6}{1}$$
$$= \frac{24}{5} \times \frac{1}{6}$$
$$= \frac{\cancel{24}^{4} \times 1}{5 \times \cancel{6}_{1}}$$
$$= \frac{4}{5}$$

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23. $c \div (ab)$

$$\begin{aligned} c \div (ab) &= 6 \div \left(4\frac{4}{5} \times \frac{2}{3}\right) \\ &= 6 \div \left(\frac{24}{5} \times \frac{2}{3}\right) \\ &= 6 \div \left(\frac{\overset{8}{\cancel{24}} \times 2}{5 \times \underset{1}{\cancel{3}}}\right) \\ &= 6 \div \frac{16}{5} \\ &= \frac{6}{1} \times \frac{5}{16} \\ &= \frac{\overset{3}{\cancel{6}} \times 5}{1 \times \underset{8}{\cancel{16}}} \\ &= \frac{15}{8} \text{ or } 1\frac{7}{8} \end{aligned}$$

25. **MEASUREMENT** Suppose you are designing the layout for your school yearbook. If a student photograph is $1\frac{3}{8}$ inches wide, how many photographs will fit across a page that is $6\frac{7}{8}$ inches wide? Assume there is no spacing between photographs.

$$\begin{aligned} 13\frac{1}{2} \div 2\frac{1}{4} &= \frac{27}{2} \div \frac{9}{4} \\ &= \frac{27}{2} \times \frac{4}{9} \\ &= \frac{\overset{3}{\cancel{27}} \times \overset{2}{\cancel{4}}}{\underset{1}{\cancel{2}} \times \underset{1}{\cancel{9}}} \\ &= \frac{6}{1} \text{ or } 6 \end{aligned}$$

Six photographs will fit on a page.

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27. **BORDERS** The length of a kitchen wall is $24\frac{2}{3}$ feet long. A border will be placed along the wall of the kitchen. If the border comes in strips that are each $1\frac{3}{4}$ feet long, how many strips of border are needed?

Divide the length of the kitchen wall by the length of the strip of border.

$$24\frac{2}{3} \div 1\frac{3}{4} = \frac{74}{3} \div \frac{7}{4}$$
$$= \frac{74}{3} \times \frac{4}{7}$$
$$= \frac{296}{21}$$
$$= 14\frac{2}{21}$$

15 strips will be needed.

HURRICANES Use the following information.

Suppose a hurricane traveled 130 miles from a point in the Atlantic Ocean to the Florida coastline in $6\frac{1}{2}$ hours.

29. How many miles per hour did the hurricane travel?

$$\text{Speed} = \text{distance} \div \text{time}$$
$$= 130 \div 6\frac{1}{2}$$
$$= 130 \div \frac{13}{2}$$
$$= 130 \times \frac{2}{13}$$
$$= \frac{130 \times 2}{13}$$
$$= \frac{260}{13}$$
$$= 20$$

The hurricane traveled at a speed of 20 mph.

31. **OPEN ENDED** Find two mixed numbers with a quotient of $2\frac{2}{3}$

Sample answer: $8\frac{2}{3} \div 3\frac{1}{4}$

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33. **CHALLENGE** Without dividing, explain whether $5\frac{1}{6} \div 3\frac{5}{8}$ is greater than or less than $5\frac{1}{6} \div 2\frac{2}{5}$.

less than; Sample answer: since $3\frac{5}{8} > 2\frac{2}{5}$, the quotient $5\frac{1}{6} \div 3\frac{5}{8} < 5\frac{1}{6} \div 2\frac{2}{5}$. The expression $5\frac{1}{6} \div 3\frac{5}{8}$ represents $5\frac{1}{6}$ being divided into a greater number of parts than the expression $5\frac{1}{6} \div 2\frac{2}{5}$. If $5\frac{1}{6}$ is divided into a greater number of parts, each part will be smaller.

35. The largest meteorite crater is in Winslow, Arizona, with a depth of about $\frac{2}{50}$ mile and a distance across of about $\frac{4}{5}$ mile. How many times greater is the distance across the meteorite than its depth?

A about 20

B about $15\frac{1}{2}$

C about $5\frac{1}{2}$

D about 5

$$\frac{4}{5} \div \frac{2}{50} = \frac{4}{5} \times \frac{50}{2}$$
$$= \frac{2}{1} \times \frac{10}{1}$$
$$= \frac{20 \times 1}{1 \times 1}$$
$$= \frac{20}{1} \text{ or } 20$$

It is about 20 times greater in distance across the meteorite than in depth.

37. If a quart is $\frac{1}{4}$ of a gallon and a pint is $\frac{1}{8}$ of a gallon, how much of a quart is a pint?

$$\frac{1}{8} \div \frac{1}{4} = \frac{1}{8} \times \frac{4}{1}$$
$$= \frac{1}{4} \times \frac{2}{1}$$
$$= \frac{2}{4} = \frac{1}{2}$$

$\frac{1}{2}$ qt

Multiply. Write in simplest form.

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39. $\frac{4}{5} \times 1\frac{3}{4}$

$$\frac{4}{5} \times 1\frac{3}{4} = \frac{4}{5} \times \frac{7}{4}$$
$$= \frac{\overset{1}{\cancel{4}} \times 7}{5 \times \underset{1}{\cancel{4}}}$$
$$= \frac{7}{5} \text{ or } 1\frac{2}{5}$$

41. $1\frac{1}{8} \times 5\frac{1}{3}$

$$1\frac{1}{8} \times 5\frac{1}{3} = \frac{9}{8} \times \frac{16}{3}$$
$$= \frac{\overset{3}{\cancel{9}} \times \overset{2}{\cancel{16}}}{\underset{1}{\cancel{8}} \times \underset{1}{\cancel{3}}}$$
$$= \frac{6}{1} \text{ or } 6$$