

New
PIONEERS
GRADED
MATHS



Rasha Al-Shafee

Verified by: *Dr. Ibrahim Nofal*


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Compare and Order Fractions and Decimals

Compare. 2.8 and $2\frac{2}{3}$

Step 1

Write the decimal as a mixed number.

$$2.8 = 2\frac{8}{10}$$

Step 2

Write the equivalent fractions with a common denominator.

$$2\frac{8}{10} = 2\frac{24}{30}$$

$$2\frac{2}{3} = 2\frac{20}{30}$$

Step 3

Compare the mixed number.

$$2\frac{24}{30} > 2\frac{20}{30}$$

$$\text{so } 2.8 > 2\frac{2}{3}$$

Compare. Write $>$, $<$, or $=$ for each .

$$\frac{17}{20} \text{ } 0.7$$

$$0.46 \text{ } \frac{4}{20}$$

$$0.75 \text{ } \frac{3}{4}$$

$$\frac{1}{16} \text{ } 0.09$$

$$4\frac{3}{8} \text{ } 4.3$$

$$\frac{19}{20} \text{ } 0.95$$

$$\frac{8}{10} \text{ } 0.08$$

$$1\frac{2}{5} \text{ } 1.41$$

$$3.07 \text{ } 3\frac{7}{10}$$

$$5\frac{7}{8} \text{ } 5.9$$

$$1.15 \text{ } 1\frac{1}{7}$$

$$\frac{11}{15} \text{ } 0.9$$

Compare. Write in order from least to greatest.

$$\frac{55}{100}, 0.6, 0.75$$

$$\frac{6}{20}, 0.7, \frac{4}{10}$$

$$\frac{5}{10}, \frac{3}{4}, 0.4$$

$$0.51, \frac{6}{15}, 0.15$$

$$6.9, 6\frac{4}{15}, 6\frac{1}{5}$$

$$8\frac{2}{5}, 8.6, 8\frac{4}{9}$$

Estimate Sums and Differences

Estimate Sums and Differences

Estimate the sum of $\frac{5}{8}$, $2\frac{3}{4}$, and $3\frac{3}{5}$.

Step 1: Round each fraction or mixed number.

$$\frac{5}{8} \text{ is about } \frac{1}{2}$$

$$2\frac{3}{4} \text{ is about } 3$$

$$3\frac{3}{5} \text{ is about } 3\frac{1}{2}$$

Step 2: Add the estimates.

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

Estimate the difference of $4\frac{1}{3}$ and $1\frac{5}{6}$.

Step 1: Round each fraction or mixed number.

$$4\frac{1}{3} \text{ is about } 4$$

$$1\frac{5}{6} \text{ is about } 2$$

Step 2: Subtract the estimates.

$$4 - 2 = 2$$

Estimate each sum or difference.

$$7\frac{1}{4} - 2\frac{5}{9}$$

$$\frac{7}{8} + 5\frac{3}{4}$$

$$3\frac{4}{7} - 1\frac{1}{10}$$

$$5\frac{1}{2} + 4\frac{9}{10}$$

$$3\frac{7}{12} + 2\frac{1}{7}$$

$$4\frac{15}{16} - 3\frac{3}{5}$$

Estimate the sum or difference. Write $<$ or $>$ for each \bigcirc .

$$8\frac{1}{9} - 4\frac{4}{7} \bigcirc \frac{4}{9} - 1\frac{7}{8}$$

$$9\frac{1}{12} - 6\frac{3}{8} \bigcirc 1\frac{3}{4} + 3\frac{7}{9}$$

$$3\frac{1}{7} + 4\frac{2}{9} \bigcirc 10\frac{3}{5} - 1\frac{3}{4}$$

$$1\frac{5}{6} + 4\frac{5}{8} \bigcirc 8\frac{5}{6} - 3\frac{1}{10}$$

Add and Subtract With Like Denominators

Find $\frac{4}{5} + \frac{3}{5}$.

Step 1: Add the numerators. Keep the same denominator.

$$\frac{4}{5} + \frac{3}{5} = \frac{7}{5}$$

Step 2: Simplify the answer.

$$\frac{7}{5} = 1\frac{2}{5}$$

Find $5\frac{1}{8} - 2\frac{5}{8}$.

Step 1: Since $\frac{1}{8} < \frac{5}{8}$ rename the numerator.

$$5\frac{1}{8} - 2\frac{5}{8} = 4\frac{9}{8} - 2\frac{5}{8}$$

Step 2: Subtract. Simplify the answer.

$$4\frac{9}{8} - 2\frac{5}{8} = 2\frac{4}{8} = 2\frac{1}{2}$$

Add or subtract. Write your answer in simplest form.

$$\frac{4}{7} + \frac{5}{7}$$

$$\frac{8}{9} - \frac{2}{9}$$

$$\frac{11}{16} + \frac{7}{16}$$

$$\frac{13}{15} - \frac{4}{15}$$

$$7\frac{2}{3} + 2\frac{1}{3}$$

$$6\frac{1}{5} - 3\frac{4}{5}$$

$$8\frac{3}{4} + 9\frac{3}{4}$$

$$6\frac{5}{8} - 2\frac{7}{8}$$

$$4\frac{5}{6} + 7\frac{5}{6}$$

$$5\frac{7}{10} - 1\frac{1}{10}$$

$$1\frac{1}{8} + 2\frac{7}{8}$$

$$10\frac{1}{12} + 3\frac{5}{12}$$

Add With Unlike Denominators

Find $2\frac{3}{4} + 1\frac{2}{3}$

Step 1

Write equivalent fractions with a common denominator.

$$\frac{3}{4} = \frac{3 \times 3}{4 \times 3} = \frac{9}{12}$$

$$\frac{2}{3} = \frac{2 \times 4}{3 \times 4} = \frac{8}{12}$$

Step 2

Add the numerators. Add the whole numbers. Simplify.

$$\begin{array}{r} 2\frac{3}{4} = 2\frac{9}{12} \\ + 1\frac{2}{3} = + 1\frac{8}{12} \\ \hline 3\frac{17}{12} = 4\frac{5}{12} \end{array}$$

Find each sum. Write your answer in simplest form.

$$3\frac{5}{8} + 2\frac{1}{4}$$

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

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

$$4\frac{2}{7} + 1\frac{1}{2}$$

Subtract With Unlike Denominators

Find $9\frac{2}{5} - 3\frac{1}{2}$

Step 1

Write equivalent fractions, using the LCM. The LCM of 5 and 2 is 10.

$$9\frac{2}{5} = 9\frac{4}{10}$$

$$-3\frac{1}{2} = -3\frac{5}{10}$$

Step 2

Since $\frac{4}{10} < \frac{5}{10}$ you need to rename.

$$\begin{aligned} 9\frac{4}{10} &= 8 + \frac{10}{10} + \frac{4}{10} \\ &= 8\frac{14}{10} \end{aligned}$$

Step 3

Subtract. Simplify

$$\begin{array}{r} 8\frac{14}{10} \\ - 3\frac{5}{10} \\ \hline 5\frac{9}{10} \end{array}$$

Find each difference. Write your answer in simplest form.

$$\frac{9}{16} - \frac{1}{4}$$

$$9\frac{3}{4} - 7\frac{1}{3}$$

$$5\frac{11}{15} - \frac{2}{3}$$

$$8\frac{1}{2} - 5\frac{5}{6}$$

Estimate

Fraction Products and Quotients

Estimate Products and Quotients

Estimate $2\frac{1}{3} \times 1\frac{4}{5}$

Step 1: Round each factor to the nearest whole number.

$2\frac{1}{3}$ is about 2.

$1\frac{4}{5}$ is about 2.

Step 2: Multiply the rounded factors.

$$2 \times 2 = 4$$

Estimate $9\frac{1}{3} \div 2\frac{5}{6}$

Step 1: Use compatible numbers.

9 can be divided by 3 evenly.

$9\frac{1}{3}$ is close to 9.

$2\frac{5}{6}$ is close to 3.

Step 2: Divide the compatible numbers.

$$9 \div 3 = 3$$

Estimate each product. Tell whether the estimate is an underestimate or an overestimate.

$$3\frac{2}{7} \times 4\frac{1}{9}$$

$$6\frac{5}{8} \times 2\frac{3}{4}$$

$$4\frac{1}{2} \times 2\frac{9}{10}$$

$$1\frac{2}{9} \times 6\frac{1}{3}$$

$$8\frac{3}{4} \times 3\frac{4}{5}$$

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

Estimate each quotient.

$$11\frac{3}{4} \div 1\frac{4}{5}$$

$$14\frac{1}{2} \div 3\frac{1}{8}$$

$$7\frac{3}{4} \div 2\frac{1}{2}$$

$$17\frac{1}{3} \div 5\frac{3}{4}$$

$$20\frac{1}{2} \div 5\frac{1}{3}$$

$$15\frac{4}{5} \div 3\frac{2}{3}$$

Multiply Fractions

Find $\frac{4}{5} \times \frac{1}{2}$.

Step 1: multiply the numerators.
Then multiply the denominators.

$$\frac{4}{5} \times \frac{1}{2} = \frac{4 \times 1}{5 \times 2} = \frac{4}{10}$$

Step 2: Simplify the product.

$$\frac{4}{10} = \frac{2}{5}$$

Find $8 \times \frac{1}{3}$.

Step 1: Rewrite 8 as a fraction.

$$\frac{8}{1} \times \frac{1}{3}$$

Step 2: Multiply the numerators. Then multiply the denominators.
Simplify the product.

$$\frac{8}{1} \times \frac{1}{3} = \frac{8 \times 1}{1 \times 3} = \frac{8}{3} = 2\frac{2}{3}$$

Multiply. Write each product in simplest form.

$$\frac{3}{4} \times \frac{8}{9}$$

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

$$4 \times \frac{5}{6}$$

Multiply Mixed Numbers

Find $2\frac{3}{4} \times 1\frac{1}{2}$.

Step 1

Write the mixed numbers as improper fractions.

$$2\frac{3}{4} = \frac{11}{4} \quad 1\frac{1}{2} = \frac{4}{2}$$

Step 2

Multiply. Simplify if possible.
Write the product in simplest form.

$$\frac{11}{4} \times \frac{4}{3} = \frac{11 \times \cancel{4}^1}{\cancel{4}_1 \times 3} = \frac{11}{3} = 3\frac{2}{3}$$

Multiply. Write each product in simplest form.

$$4\frac{4}{5} \times 3\frac{5}{6}$$

$$\frac{5}{9} \times 3\frac{3}{5}$$

$$2\frac{1}{6} \times 1\frac{1}{3}$$

$$1\frac{2}{3} \times 4\frac{1}{5}$$

$$3\frac{3}{8} \times 1\frac{5}{9}$$

$$2\frac{1}{4} \times \frac{1}{3}$$

$$1\frac{1}{8} \times 3\frac{1}{3}$$

$$2\frac{1}{7} \times 2\frac{2}{5}$$

Divide Fractions

How to Divide by a Fraction

Find $\frac{5}{8} \div \frac{2}{3}$.

Step 1

Rewrite as a multiplication problem using the reciprocal of the divisor.

$$\frac{5}{8} \div \frac{2}{3} = \frac{5}{8} \times \frac{3}{2}$$

Step 2

Multiply. Write the product in simplest form.

$$\frac{5}{8} \times \frac{3}{2} = \frac{15}{16}$$

Find each quotient. Write each quotient in simplest form.

$$\frac{7}{8} \div \frac{3}{4}$$

$$\frac{3}{4} \div \frac{3}{8}$$

$$\frac{7}{8} \div \frac{5}{16}$$

$$\frac{5}{6} \div \frac{2}{3}$$

$$\frac{11}{12} \div \frac{1}{3}$$

Divide Mixed Numbers

How to Divide Mixed Numbers

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

Step 1

Rewrite the mixed numbers as improper fractions.

$$\begin{aligned} 3\frac{1}{8} \div 2\frac{1}{4} \\ = \frac{25}{8} \div \frac{9}{4} \end{aligned}$$

Step 2

Rewrite as a multiplication problem using the reciprocal of the divisor.

$$\frac{25}{8} \times \frac{4}{9}$$

Step 3

Simplify using prime factorization. Then multiply. Simplify.

$$\begin{aligned} \frac{25}{8} \times \frac{4}{9} &= \\ \frac{5 \times 5 \times \overset{1}{\cancel{2}} \times \overset{1}{\cancel{2}}}{\underset{1}{\cancel{2}} \times \underset{1}{\cancel{2}} \times 2 \times 3 \times 3} &= \frac{25}{18} \\ \frac{25}{18} &= 1\frac{7}{18} \end{aligned}$$

Divide. Express each quotient in simplest form.

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

$$8 \div 2\frac{3}{4}$$

$$3\frac{1}{3} \div 1\frac{1}{3}$$

$$1\frac{1}{6} \div 3$$

$$4\frac{1}{2} \div 1\frac{1}{3}$$

Multiply Decimals

Find 2.67×0.71

Step 1

Estimate the product.

$$\begin{array}{r} 2.67 \text{ rounds to } 3 \\ \times 0.71 \qquad \qquad \times 1 \\ \hline \end{array}$$

Step 2

Multiply the factors as if there were no decimal point.

$$\begin{array}{r} 44 \\ 267 \\ \times 71 \\ \hline 267 \\ 18890 \\ \hline 18957 \end{array}$$

Step 3

Place the decimal point in the product.

$$\begin{array}{r} 2.67 \text{ 2 decimal} \\ \times 0.71 \text{ + 2 decimal} \\ \hline 1.8957 \text{ 4 decimal} \end{array}$$

Find each product. Estimate first.

5.4×9

4.63×3

5.61×3.8

25.76×6

21.1×5.5

15.3×1.9

1.74×7

14.6×2.3

$$\begin{array}{r} 3.172 \\ \times 9.4 \\ \hline \end{array}$$

$$\begin{array}{r} 11.7 \\ \times 25.2 \\ \hline \end{array}$$

$$\begin{array}{r} 24.19 \\ \times 8.6 \\ \hline \end{array}$$

$$\begin{array}{r} 14.35 \\ \times 1.75 \\ \hline \end{array}$$

Multiply and Divide by Powers of Ten

Multiply by Powers of 10

$$5.714 \times 10^1 = 57.14$$

$$5.714 \times 10^2 = 571.4$$

$$5.714 \times 10^3 = 5714$$

The exponent shows how many places you move the decimal point.

Divide by Powers of 10

$$483.7 \div 10^1 = 48.37$$

$$483.7 \div 10^2 = 4.837$$

$$483.7 \div 10^3 = 0.4837$$

Use each product or quotient, using mental math.

$$1.365 \times 10^1 = \underline{\hspace{2cm}} \quad 873.6 \times 10^1 = \underline{\hspace{2cm}} \quad 479 \times 10^1 = \underline{\hspace{2cm}}$$

$$1.365 \times 10^2 = \underline{\hspace{2cm}} \quad 873.6 \times 10^2 = \underline{\hspace{2cm}} \quad 479 \times 10^2 = \underline{\hspace{2cm}}$$

$$1.365 \times 10^3 = \underline{\hspace{2cm}} \quad 873.6 \times 10^3 = \underline{\hspace{2cm}} \quad 479 \times 10^3 = \underline{\hspace{2cm}}$$

Find each product or quotient, using mental math.

$$89.15 \times 10^3$$

$$217.5 \div 10^2$$

$$4,000 \times 10^{-3}$$

$$89.25 \div 10^1$$

$$3.107 \times 10^1$$

$$45.21 \div 10^3$$

$$45.21 \div 10^3$$

$$2,100 \times 10^{-2}$$

$$5.7 \div 10^3$$

Divide

Decimals by Whole Numbers

Find $95.25 \div 5$.

Step 1

Estimate, using compatible numbers.

$$5 \overline{)95.25}$$

is about $5 \overline{)9} \frac{1}{9}$

Step 2

Divide as if the decimal point weren't there.

$$\begin{array}{r} 195 \\ 5 \overline{)95.25} \\ \underline{-5} \\ 45 \\ \underline{-45} \\ 0025 \\ \underline{-25} \\ 0000 \end{array}$$

Step 3

Place the decimal point in the quotient directly above the decimal point in the dividend.

$$\begin{array}{r} 19.5 \\ 5 \overline{)95.25} \\ \underline{-5} \\ 45 \\ \underline{-45} \\ 0025 \\ \underline{-25} \\ 0000 \end{array}$$

Divide. Show your work. Then check your work.

$$7 \overline{)7.91}$$

$$8 \overline{)12.56}$$

$$5 \overline{)8.35}$$

$$2 \overline{)14.9}$$

$$6 \overline{)76.2}$$

$$58.518 \div 2$$

$$3.134 \div 20$$

$$78.56 \div 16$$

Divide Decimals by Decimals

Find $19.071 \div 2.34$

Step 1

Multiply the divisor and dividend by same power of 10 so that the divisor is a whole number.

$$\begin{array}{r} 2.34 \overline{)19.071} \\ \text{w} \quad \text{w} \end{array}$$

Step 2

Divide. Place a decimal point in the quotient directly above the decimal point in the dividend.

$$\begin{array}{r} 8.15 \\ 234 \overline{)1907.10} \\ - 1872 \\ \hline 351 \\ - 234 \\ \hline 1170 \\ - 1170 \\ \hline 0 \end{array}$$

Divide. Show your work. Then check your work.

$$2.5 \overline{)6.31}$$

$$4.3 \overline{)12.9}$$

$$5.6 \overline{)25.9}$$

$$3.6 \overline{)9.63}$$

$$0.02 \overline{)2.88}$$

$$2.5 \overline{)4.965}$$

$$0.12 \overline{)1.008}$$

$$3.7 \overline{)23.828}$$

$$18.2 \div 5.6$$

Measurement Concepts

Nonstandard Units of Measure

- A small paper clip is about one inch long.
- A sheet of notebook paper is about one foot long.
- A dinner roll weighs about one ounce.
- A loaf of bread weighs about one pound.

Estimate and then use a large paper clip or a sheet of notebook paper to measure each object.

	Estimate	Actual
The length of your shoe	_____	_____
The length of your ring finger	_____	_____
The width of a TV screen	_____	_____
The height of a door	_____	_____
The height of a table	_____	_____
The width of your math book	_____	_____
The length of your bed	_____	_____
The width of a window	_____	_____