

NON-GRADED FRACTION SELF-ASSESSMENT ANSWERS

(1) Add: $\frac{11}{12} + \frac{5}{8}$

Find a common denominator:

$$12 = 2 \times 2 \times 3$$

$$8 = 2 \times 2 \times 2$$

LCD = $2 \times 2 \times 2 \times 3 = 24$

Change to the common denominator and add:

$$\begin{array}{r} \frac{11}{12} \times \frac{2}{2} = \frac{22}{24} \\ + \frac{5}{8} \times \frac{3}{3} = \frac{15}{24} \\ \hline \end{array}$$

$$\frac{37}{24}$$

Change the improper fraction to a mixed number by dividing the bottom into top:

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



(2) Subtract: $\frac{9}{10} - \frac{5}{6}$

Find a common denominator:

$$10 = 2 \times 5$$

$$6 = 2 \times 3$$

LCD = $2 \times 3 \times 5 = 30$

Change to the common denominator, and then subtract:

$$\begin{array}{r} \frac{9}{10} \times \frac{3}{3} = \frac{27}{30} \\ - \frac{5}{6} \times \frac{5}{5} = \frac{25}{30} \\ \hline \end{array}$$

$$\frac{2}{30}$$

Simplify the fraction to lowest terms:

$$\frac{2}{30} = \frac{2 \times 1}{2 \times 15} = \frac{\cancel{2} \times 1}{\cancel{2} \times 15} = \frac{1}{15}$$



(3) Multiply: $\frac{5}{6} \times \frac{13}{15}$

Do you know **WHY** we don't find a common denominator when multiplying fractions?

Write the two fractions in prime factored form, cancel any occurrences of the number one, and then multiply straight across:

$$\frac{5}{6} \times \frac{13}{15} = \frac{5 \times 13}{2 \times 3 \times 3 \times 5} = \frac{\cancel{5} \times 13}{2 \times 3 \times 3 \times \cancel{5}} = \frac{13}{18}$$

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(4) Divide: $\frac{1}{6} \div \frac{2}{9}$

Do you know **WHY** we flip the second fraction upside-down, and then multiply?

Change this into a multiplication problem:

$$\frac{1}{6} \div \frac{2}{9} \rightarrow \frac{1}{6} \times \frac{9}{2}$$

Write the two fractions in prime factored form, cancel any occurrences of the number one, and then multiply straight across:

$$\frac{1}{6} \times \frac{9}{2} = \frac{1 \times 3 \times 3}{2 \times 3 \times 2} = \frac{1 \times \cancel{3} \times 3}{2 \times \cancel{3} \times 2} = \frac{3}{4}$$

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(5) Add: $6\frac{3}{4} + 3\frac{5}{8} + 2\frac{1}{3}$

Find a common denominator:

$$4 = 2 \times 2$$

$$8 = 2 \times 2 \times 2$$

$$3 = \qquad \qquad \qquad 3$$

$$\text{LCD} = 2 \times 2 \times 2 \times 3 = 24$$

Change to the common denominator, and then add the fractions and add the whole numbers:

$$\begin{aligned} 6\frac{3}{4} \times \frac{6}{6} &= 6\frac{18}{24} \\ 3\frac{5}{8} \times \frac{3}{3} &= 3\frac{15}{24} \\ + 2\frac{1}{3} \times \frac{8}{8} &= 2\frac{8}{24} \end{aligned}$$

$$11\frac{41}{24}$$

Change the improper fraction to a mixed number by dividing the bottom into top. Add the whole number of the resulting mixed number to the 11:

$$11\frac{41}{24} = 12\frac{17}{24}$$



(6) Subtract: $15\frac{2}{9} - 6\frac{5}{12}$

Find a common denominator:

$$9 = \qquad \qquad \qquad 3 \times 3$$

$$12 = 2 \times 2 \times 3$$

$$\text{LCD} = 2 \times 2 \times 3 \times 3 = 36$$

Change to the common denominator:

$$\begin{aligned} 15\frac{2}{9} \times \frac{4}{4} &= 15\frac{8}{36} \\ - 6\frac{5}{12} \times \frac{3}{3} &= 6\frac{15}{36} \end{aligned}$$

Because 15 cannot be subtracted from 8, we need to borrow one whole from the 15. This one whole is written with the LCD as

36/36. Now subtract:

$$\begin{aligned} 15\frac{2}{9} \times \frac{4}{4} &= 15\frac{8}{36} = 14\frac{8}{36} + \frac{36}{36} = 14\frac{44}{36} \\ - 6\frac{5}{12} \times \frac{3}{3} &= 6\frac{15}{36} \qquad \qquad \qquad = 6\frac{15}{36} \end{aligned}$$

$$8\frac{29}{36}$$



(7) Multiply: $3\frac{1}{8} \times 2\frac{5}{6}$

First change each mixed number to an improper fraction:

$$\frac{25}{8} \times \frac{17}{6}$$

Write the two fractions in prime factored form, cancel any occurrences of the number one, and then multiply straight across:

$$\frac{25}{8} \times \frac{17}{6} = \frac{5 \times 5 \times 17}{2 \times 2 \times 2 \times 2 \times 3} = \frac{425}{48}$$

Change the improper fraction to a mixed number by dividing the bottom into top:

$$\frac{425}{48} = 8\frac{41}{48}$$

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(8) Divide: $9\frac{1}{5} \div 6\frac{3}{4}$

First change each mixed number to an improper fraction:

$$\frac{46}{5} \div \frac{27}{4}$$

Change this into a multiplication problem:

$$\frac{46}{5} \div \frac{27}{4} \rightarrow \frac{46}{5} \times \frac{4}{27}$$

Write the two fractions in prime factored form, cancel any occurrences of the number one, and then multiply straight across:

$$\frac{46}{5} \times \frac{4}{27} = \frac{2 \times 23 \times 2 \times 2}{5 \times 3 \times 3 \times 3} = \frac{184}{135}$$

Change the improper fraction to a mixed number by dividing the bottom into top:

$$\frac{184}{135} = 1\frac{49}{135}$$

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(9) Which fraction is the smallest:

$$\frac{5}{16}, \frac{3}{8}, \frac{1}{4}, \frac{1}{3}$$

Find a common denominator:

$$16 = 2 \times 2 \times 2 \times 2$$

$$8 = 2 \times 2 \times 2$$

$$4 = 2 \times 2$$

$$3 = \qquad \qquad \qquad 3$$

$$\text{LCD} = 2 \times 2 \times 2 \times 2 \times 3 = 48$$

Change each fraction to the LCE:

$$\frac{5}{16} \times \frac{3}{3} = \frac{15}{48}$$

$$\frac{3}{8} \times \frac{6}{6} = \frac{18}{48}$$

$$\frac{1}{4} \times \frac{12}{12} = \frac{12}{48}$$

$$\frac{1}{3} \times \frac{16}{16} = \frac{16}{48}$$

Compare only the numerators since the denominators are the same. 12 is the smallest so the smallest fraction is:

$$\frac{12}{48} \text{ or } \frac{1}{4}$$



(10) Find the GCF of 24 and 30

Find the prime factorization of each number (using factor trees):

$$24 = 2 \times 2 \times 2 \times 3$$

$$30 = 2 \times 3 \times 5$$

$$\text{GCF} = 2 \times 3 = 6$$



(11) Find the LCM of 24 and 30

Find the prime factorization of each number (using factor trees):

$$24 = 2 \times 2 \times 2 \times 3$$

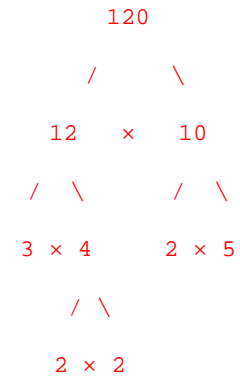
$$30 = 2 \times 3 \times 5$$

$$\text{LCM} = 2 \times 2 \times 2 \times 3 \times 5 = 120$$

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(12) Show the prime factorization of 120

To find a prime factorization, use a factor tree:



$$120 = 2 \times 2 \times 2 \times 3 \times 5$$

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