Walt Practice and revise multiplying and dividing fractions
Success Criteria I can…
1. Multiply the numerator and denominator
2. I can simplify fractions
3. I can write improper fractions as a mixed numeral
4. I can write a reciprocal fraction when dividing fractions and then apply multiplication skills

Examples

Fractions – Multiplication and Division

Multiplication of Fractions using Written Methods

To multiply fractions using written methods we begin by converting any mixed numerals (whole numbers plus fractions) into improper fractions.

For the problem $2\frac{2}{3} \times 1\frac{3}{4}$ we rewrite each of the mixed numerals as improper fractions i.e $\frac{8}{3} \times \frac{7}{4}$.

(Note $2\frac{2}{3} = \frac{2\times3+2}{3}$ and $1\frac{3}{4} = \frac{1\times4+3}{4}$)

To multiply two fractions we multiply the two numerators together (top numbers) and the two denominators together (bottom numbers).

In summary

$$2\frac{2}{3} \times 1\frac{3}{4} = \frac{8}{3} \times \frac{7}{4}$$
$$= \frac{56}{12}$$
$$= 4\frac{8}{12} \left(4\frac{2}{3}\right)$$

Multiplication of Fractions using a Calculator

On the Casio fx-82MS we enter the problem from left to right just as it is written down using the fraction key.

For the problem $2\frac{2}{3} \times 1\frac{3}{4}$ we enter:

2	ab/c	2	ab/c	3	×	1

ab/c	3	ab/c	4	=

which gives $4\frac{2}{3}$.

When using a calculator it is a good idea to do the problem twice, ensuring you get the same answer both times. This reduces the likelihood of 'key in' error.

Division of Fractions using Written Methods

To divide fractions using written methods we begin by converting any mixed numerals (whole numbers plus fractions) into improper fractions.

For the problem $2\frac{2}{3} \div 1\frac{3}{4}$ we rewrite each of the mixed numerals as improper fractions i.e $\frac{8}{3} \div \frac{7}{4}$.

(Note $2\frac{2}{3} = \frac{2\times3+2}{3}$ and $1\frac{3}{4} = \frac{1\times4+3}{4}$)

To divide fractions we multiply by the reciprocal. The reciprocal of a fraction is where the numerator becomes the denominator and vice versa. The reciprocal of $\frac{7}{4}$ is $\frac{4}{7}$. To divide fractions the first fraction remains the same, the division sign becomes a multiplication sign and the second fraction is changed to the reciprocal.

In summary

$$2\frac{2}{3} \div 1\frac{3}{4} = \frac{8}{3} \div \frac{7}{4}$$
$$= \frac{8}{3} \times \frac{4}{7}$$
$$= \frac{32}{21}$$
$$= 1\frac{11}{21}$$

Division of Fractions using a Calculator

On the TI-30XB Multiview we enter the problem from left to right just as it is written down using the fraction key.

For the problem $2\frac{2}{3} \div 1\frac{3}{4}$ we enter:

2	2nd	$\frac{n}{d}$	2	▼	3	▶

÷	1	2nd	$\frac{n}{d}$	3	▼	4

enter

which gives $\frac{32}{21} = 1\frac{11}{21}$.

Example

Evaluate the following using written methods.

a) $3\frac{2}{5} \times 1\frac{3}{7}$

b) $4\frac{5}{8} \div 2\frac{4}{5}$

We begin by changing any mixed numerals to improper fractions.

a)
$$3\frac{2}{5} \times 1\frac{3}{7} = \frac{17}{5} \times \frac{10}{7}$$
$$= \frac{170}{35}$$
$$= 4\frac{6}{7}$$

b)
$$4\frac{5}{8} \div 2\frac{4}{5} = \frac{37}{8} \div \frac{14}{5}$$
$$= \frac{37}{8} \times \frac{5}{14}$$
$$= \frac{185}{112}$$
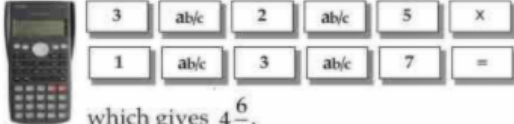$$= 1\frac{73}{112}$$

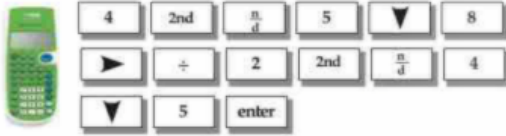## Example

Evaluate the following using your calculator.

a) $3\frac{2}{5} \times 1\frac{3}{7}$

b) $4\frac{5}{8} \div 2\frac{4}{5}$

We enter the problem from left to right just as it is written down.

a)

| 3 | ab/c | 2 | ab/c | 5 | x |
| 1 | ab/c | 3 | ab/c | 7 | = |

which gives $4\frac{6}{7}$.

b)

4	2nd	$\frac{n}{d}$	5	▼	8
►	÷	2	2nd	$\frac{n}{d}$	4
▼	5	enter			

which gives $\frac{185}{112}$. This can be displayed as the mixed numeral $1\frac{73}{112}$ by pressing

| 2nd | $\frac{n}{d} \leftrightarrow U\frac{n}{d}$ |

Try solving -

342. $\dfrac{2}{7} \times \dfrac{3}{5} =$

343. $\dfrac{5}{6} \times \dfrac{8}{9} =$

344. $\dfrac{3}{4} \div \dfrac{2}{9} =$

345. $\dfrac{5}{11} \div \dfrac{4}{7} =$

346. $1\dfrac{3}{4} \times \dfrac{7}{8} =$

347. $\dfrac{5}{6} \times 2\dfrac{2}{3} =$

348. $3\dfrac{1}{2} \div \dfrac{5}{8} =$

349. $\dfrac{5}{9} \div 2\dfrac{10}{11} =$

350. $4\dfrac{1}{5} \times 4\dfrac{2}{3} =$

351. $3\dfrac{2}{9} \times 2\dfrac{1}{3} =$

352. $\dfrac{2}{5} \div \dfrac{1}{4} \div \dfrac{2}{3} =$

353. $1\dfrac{1}{7} \div 2\dfrac{1}{3} \div 1\dfrac{3}{4} =$

354. $\dfrac{2}{3} \times \dfrac{3}{4} \times \dfrac{4}{5} =$

355. $1\dfrac{1}{3} \times 2\dfrac{1}{5} \times 2\dfrac{2}{7} =$

356. $2\dfrac{2}{3} \div 1\dfrac{1}{4} \div 2\dfrac{5}{7} =$

357. $2\dfrac{1}{8} \times 1\dfrac{1}{2} \times 1\dfrac{2}{3} =$

Try the challenge

Merit – Answer the following application problems, showing a line of working to indicate the calculation you are doing.

358. A recipe calls for $\frac{1}{3}$ of a cup of white flour. If a person wishes to halve the recipe how much flour will they now require?

359. If $\frac{4}{7}$ of Year 11 girls at a school play netball and $\frac{2}{5}$ of these also play hockey, what fraction play hockey?

360. A painter uses $15\frac{1}{2}$ litres of paint on four walls of a shed. What fraction of the paint, in litres, is used on a single wall?

361. $1\frac{1}{2}$ m lengths of wire are cut from a roll comprising $35\frac{3}{4}$ m. How many lengths can be cut and what amount is left over?

362. Tessa buys $12\frac{3}{8}$ m of fabric for costumes for a school concert. Each costume requires $2\frac{1}{5}$ m. How much fabric will she have left over?

363. A farmer uses $\frac{2}{7}$ of his land for growing corn and $\frac{4}{5}$ of the remaining area to grow potatoes. What area of his farm is used to grow potatoes?

364. Aya was left $\frac{3}{8}$ of an estate, while her brother received $1\frac{1}{4}$ more than the Aya. What fraction did the brother receive and what fraction of the estate remained undivided?

365. Chang was the leading scorer in his basketball team, scoring $\frac{4}{7}$ of the season's points. His friend scored $\frac{3}{5}$ of what Chang scored. If during the season the team scored 455 points how many did the friend score?

Some more work on next page

Calculate the following multiplication and division problems using written methods. Find your answers in the code at the bottom of the page and then enter the corresponding letter of the question to answer the riddle.

T $\quad \frac{4}{5} \times \frac{2}{9}$

Y $\quad \frac{3}{7} \div \frac{2}{5}$

R $\quad 1\frac{1}{2} \times \frac{4}{7}$

M $\quad 2\frac{2}{3} \div \frac{3}{4}$

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

T $\quad 2\frac{5}{6} \div 1\frac{3}{7}$

D $\quad 1\frac{4}{9} \times 3\frac{1}{2}$

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

K $\quad 2\frac{3}{7} \times 1\frac{1}{3}$

E $\quad \frac{3}{5} \times \frac{2}{7} \times \frac{1}{2}$

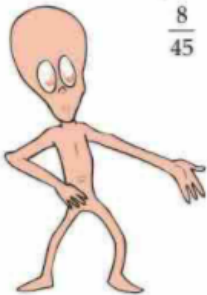U $\quad \frac{1}{4} \div \frac{2}{5} \div \frac{1}{3}$

A $\quad \frac{13}{4} \times 1\frac{2}{5}$

E $\quad \frac{9}{4} \div 2\frac{3}{8}$

W $\quad 3 \div 1\frac{2}{5}$

E $\quad 4 \times 1\frac{3}{8}$

What did the alien say to the gardener?

| $\frac{8}{45}$ | $4\frac{11}{20}$ | $3\frac{5}{21}$ | $\frac{18}{19}$ | $3\frac{5}{9}$ | $\frac{3}{35}$ | $1\frac{59}{60}$ | $1\frac{2}{11}$ |

| $1\frac{1}{14}$ | $1\frac{2}{11}$ | $1\frac{7}{8}$ | $\frac{6}{7}$ |

| $2\frac{1}{7}$ | $5\frac{1}{2}$ | $5\frac{1}{2}$ | $5\frac{1}{18}$ | $5\frac{1}{2}$ | 3 |

Merit/Excellence – Answer the following mixed fraction problems.

366. $\frac{4}{7} \times \square = 24$

367. $\frac{3}{8} \times \square = 36$

368. $\square \times \frac{5}{8} = 40$

369. $\square \times \frac{2}{9} = 16$

370. Each barbecue a family has they use $\frac{2}{9}$ of a bottle of gas. How many barbecues can the family get out of a full gas bottle?

371. A person takes a journey. They travel $\frac{1}{6}$ of the distance by bus, $\frac{4}{5}$ by train and the rest by walking.
  a) What fraction of the journey does the person walk?
  b) If the journey's total distance is 45 km, how far does the person walk?

372. If you read $\frac{11}{15}$ of a book of 405 pages, how many pages have you still to read?

373. 14 is $\frac{2}{3}$ of what amount?

374. 45 is $\frac{3}{8}$ of what amount?

375. What fraction goes three and a half times into three?

376. By how much is the product of three and two-thirds and four and four-fifths less than 20?

377. How many pieces of tape eight and two-fifths centimetres in length can be cut from a roll of tape one hundred and forty centimetres in length?

378. A farmer uses $\frac{1}{3}$ of his land for dry stock, $\frac{3}{8}$ for sheep and $\frac{1}{6}$ for crops and the remaining 23 hectares for forestry. Find the total area of the farmer's land

379. Four children share a sum of money. The first gets one half of it, the second gets one-fifth of it and the third one-tenth. If the fourth child receives $120, what was the original sum of money?