

Big Idea Tuakana-teina: The concept of older siblings teaching and working alongside younger siblings.

Do now on writing expressions

WALT Dividing algebraic terms

Success Criteria

When dividing algebraic terms containing pronumerals and numbers, follow these steps.

Step 1: Write the division as a fraction.

Step 2: Cancel the numbers, if possible.

Step 3: Cancel the pronumerals, if possible. *Step 4:* Write your answer as a fraction.

(Remember: Cancel means divide the numerator and denominator by the same number or pronumeral.)

Step 4: Write your answer as a fraction.

Meet link

<https://meet.google.com/lookup/e6orxt4snv>

1 Complete the following to simplify.

$$\begin{aligned} \mathbf{a} \quad 10y \div 15 &= \frac{10y}{\square} \\ &= \frac{2y}{\square} \end{aligned}$$

$$\begin{aligned} \mathbf{b} \quad 8m \div 12m &= \frac{\square}{12m} \\ &= \frac{\square}{3} \end{aligned}$$

$$\begin{aligned} \mathbf{c} \quad 6x \div 8xy &= \frac{\square}{8xy} \\ &= \frac{\square}{4y} \end{aligned}$$

2 Simplify the following.

$$\mathbf{a} \quad 9x \div 18$$

$$\mathbf{b} \quad 3m \div 12$$

$$\mathbf{c} \quad 5p \div 25$$

$$\mathbf{d} \quad 16d \div 4$$

$$\mathbf{e} \quad \frac{10c}{2}$$

$$\mathbf{f} \quad \frac{8a}{4}$$

$$\mathbf{g} \quad \frac{6a}{12a}$$

$$\mathbf{h} \quad \frac{44m}{22m}$$

$$\mathbf{i} \quad \frac{12a}{15a}$$

$$\mathbf{j} \quad \frac{20d}{10d}$$

$$\mathbf{k} \quad \frac{3f}{9f}$$

$$\mathbf{l} \quad \frac{4t}{20t}$$

$$\mathbf{m} \quad \frac{18p}{20d}$$

$$\mathbf{n} \quad \frac{6xy}{15x}$$

$$\mathbf{o} \quad \frac{24ab}{36bc}$$

$$\mathbf{p} \quad \frac{16r}{20qr}$$

$$\mathbf{q} \quad \frac{8yz}{40xyz}$$

$$\mathbf{r} \quad \frac{70dkl}{10klm}$$

$$\mathbf{s} \quad \frac{15pqr}{12q}$$

$$\mathbf{t} \quad \frac{14mn}{35mp}$$

Challenge


EXAMPLE 2

Simplify the following.

$$\mathbf{a} \quad \frac{-xy}{-y}$$

$$\mathbf{b} \quad \frac{40ac}{-10ac}$$

$$\mathbf{c} \quad \frac{-16x^2y}{-8x}$$

Remember: When dividing two integers:
If the signs are the same, the result is positive.
If the signs are different, the result is negative. 

$$\begin{aligned} \mathbf{a} \quad \frac{-xy}{-y} &= \frac{\cancel{-}xy}{\cancel{-}y} \\ &= x \end{aligned}$$

$$\begin{aligned} \mathbf{b} \quad \frac{40ac}{-10ac} &= \frac{\cancel{4}0ac}{\cancel{-1}0ac} \\ &= -4 \end{aligned}$$

$$\begin{aligned} \mathbf{c} \quad \frac{-16x^2y}{-8x} &= \frac{\cancel{-}216x^2y}{\cancel{-}8x} \\ &= 2xy \end{aligned}$$

3 Complete the following to simplify.

$$\begin{aligned} \text{a } \frac{15ab}{-20ac} &= \frac{15ab}{\square} \\ &= \frac{3b}{\square} \\ &= -\frac{3b}{\square} \end{aligned}$$

$$\begin{aligned} \text{b } \frac{-x}{xy} &= \frac{\square}{xy} \\ &= \frac{\square}{y} \\ &= -\frac{\square}{y} \end{aligned}$$

4 Simplify the following.

$$\text{a } \frac{-50d}{10d}$$

$$\text{b } \frac{-12fg}{-18g}$$

$$\text{c } \frac{-6kl}{9l}$$

$$\text{d } \frac{12fg}{-3gh}$$

$$\text{e } \frac{-36lm}{9m}$$

$$\text{f } \frac{-90y}{99x}$$

$$\text{g } \frac{-45c}{-15ac}$$

$$\text{h } \frac{-a^2bc}{b^2c}$$

$$\text{i } \frac{-mn}{n^2}$$

$$\text{j } \frac{x^2yz^2}{-y^2x}$$

$$\text{k } -64p \div -16q$$

$$\text{l } -6ac \div -9c$$

$$\text{m } -2mn \div -8mn$$

$$\text{n } -10 \div 5mn$$

$$\text{o } -3q \div q$$

$$\text{p } 21pq \div -3p^2$$

Extension

Simplify the following divisions by cancelling any common factors.

$$\text{a } \frac{5a}{10a}$$

$$\text{b } \frac{7x}{14y}$$

$$\text{c } \frac{10xy}{12y}$$

$$\text{d } \frac{ab}{4b}$$

$$\text{e } \frac{7xyz}{21yz}$$

$$\text{f } \frac{2}{12x}$$

$$\text{g } \frac{4xy}{7x}$$

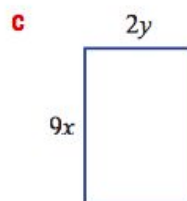
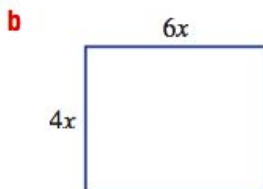
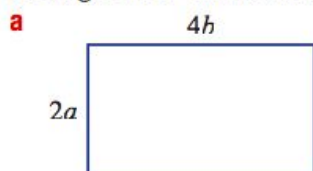
$$\text{h } \frac{3abc}{6b}$$

Cancel numbers and pronumerals where possible



Problem-solving and Reasoning

Write a simplified expression for the area of the following shapes. Recall that rectangle area = width \times length.



Simplify the following completely.

$$\text{a } 2a \times 3b + 5ab$$

$$\text{b } 6q \times 2r + 4q \times 3r$$

$$\text{c } 10x \times 2y - 3y \times 6x$$

You can combine any like terms.



Fill in the missing terms to make the following equivalences true.

$$\text{a } 3x \times \square \times z = 6xyz$$

$$\text{b } 4a \times \square = 12ab$$

$$\text{c } \frac{\square}{4r} = 7s$$

$$\text{d } \frac{\square}{2ab} = 4b$$

Joanne claims that the following three expressions are equivalent: $\frac{2a}{5}$, $\frac{2}{5} \times a$, $\frac{2}{5a}$.

a Is she right? Try different values of a .

b Which two expressions are equivalent?

c There are two values of a that make all three expressions are equal. State one of them.

Check if you can work on it

- a** Simplify $2a \times 3b + 5b \times 2a$ to a single term.
- b** State another way to fill in the blanks to make the simplification correct:
 $\square a \times \square b + \square b \times \square a = 16ab$
- c** Give an example of an even longer expression that is equivalent to $16ab$.

Check your answers

1 a $\frac{{}^2 10y}{{}^3 15} = \frac{2y}{3}$ **c** $\frac{{}^2 8m}{{}^3 12m} = \frac{2}{3}$ **e** $\frac{{}^3 6x}{{}^4 8xy} = \frac{3}{4y}$

2 a $\frac{x}{2}$ **b** $\frac{m}{4}$ **c** $\frac{p}{5}$ **d** $4d$ **e** $5c$

f $2a$ **g** $\frac{1}{2}$ **h** 2 **i** $\frac{4}{5}$ **j** 2

k $\frac{1}{3}$ **l** $\frac{1}{5}$ **m** $\frac{9p}{10d}$ **n** $\frac{2y}{5}$ **o** $\frac{2a}{3c}$

p $\frac{4}{5q}$ **q** $\frac{1}{5x}$ **r** $\frac{7d}{m}$ **s** $\frac{5pr}{4}$ **t** $\frac{2n}{5p}$

3 a $\frac{{}^3 15ab}{{}^{-4} 20ac} = -\frac{3b}{4c}$ **b** $\frac{{}^{-1} x}{{}^1 xy} = -\frac{1}{y}$

4 a -5 **b** $\frac{2f}{3}$ **c** $-\frac{2k}{3}$ **d** $-\frac{4f}{h}$

e $-4l$ **f** $-\frac{10y}{11x}$ **g** $\frac{3}{a}$ **h** $-\frac{a^2}{b}$

i $-\frac{m}{n}$ **j** $-\frac{xz^2}{y}$ **k** $\frac{4p}{q}$ **l** $\frac{2a}{3}$

m $\frac{1}{4}$ **n** $-\frac{2}{mn}$ **o** -3 **p** $-\frac{7q}{p}$

Extension answers

- | | | | |
|---|--|------------------------------|-------------------------|
| a $\frac{1}{2}$ | b $\frac{x}{2y}$ | c $\frac{5x}{6}$ | d $\frac{a}{4}$ |
| e $\frac{x}{3}$ | f $\frac{1}{6x}$ | g $\frac{4y}{7}$ | h $\frac{ax}{2}$ |
| a $8ab$ | b $24x^2$ | c $18xy$ | |
| a $11ab$ | b $24qr$ | c $2xy$ | |
| a $2y$ | b $3b$ | c $28rs$ | d $8ab^2$ |
| a no | b $\frac{2a}{5}$ and $\frac{2}{5} \times a$ | c $a = 1$ or $a = -1$ | |
| a $16ab$ | b 2, 5, 6, 1 others possible | | |
| c $2a \times 3b + 3a \times 2b + 4a \times b$. Others possible. | | | |