Unit 8 · Algebraic Fraction

WORKSHEET

Full marks 32

Name _____ Class _____ Roll no. _____ Date _____ Marks _____ / 32

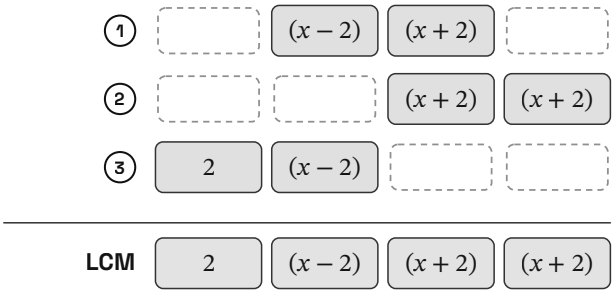
1 Key words [2.5]

Match each word or expression in Column A with its meaning in Column B. Write the letter in the box. One meaning in Column B is not needed. Each match carries 0.5 mark.

Column A		Column B
1. algebraic fraction	☐	**a.** numerator and denominator have no common factor
2. lowest terms	☐	**b.** fractions with the same denominator
3. LCM of the denominators	☐	**c.** a polynomial divided by a polynomial
4. like fractions	☐	**d.** $-(a-b)$
5. $b-a$	☐	**e.** the product of all the numerators
		f. each factor taken the most times it appears in any one denominator

2 Fill the diagram [1.5]

The tiles show the factors of three denominators and their LCM. Write the denominator each numbered row of tiles comes from. Each carries 0.5 mark.



1. _____ **2.** _____

3. _____

3 Multiple choice [5]

Choose the correct option for each of the following questions.

i. For which value of x does $\frac{x+1}{x-3}$ have no value? [1]

a. -1 **b.** 0

c. 3 **d.** 1

ii. What is $\frac{x^2-9}{x+3}$ in its lowest terms? [1]

a. $x-3$ **b.** $x-9$

c. $x+3$ **d.** x^2-3

iii. What is the LCM of a^2-1 and a^2+2a+1? [1]

a. $(a-1)(a+1)$ **b.** $(a-1)(a+1)^2$

c. $(a^2-1)(a^2+2a+1)$ **d.** $(a+1)^2$

iv. What is $\frac{3}{x-2}+\frac{1}{2-x}$? [1]

a. $\frac{2}{x-2}$ **b.** $\frac{4}{x-2}$

c. $\frac{4}{2-x}$ **d.** 0

v. A bus goes d km at 40 km/h and comes back at 60 km/h. What is its total time, in hours? [1]

a. $\frac{d}{50}$ **b.** $\frac{d}{24}$

c. $\frac{2d}{100}$ **d.** $\frac{d}{100}$

4 Very short answers [3]

Write very short answers to the following questions.

a. Factorize a^3-b^3. [1]

b. Simplify $\frac{x}{x+y}+\frac{y}{x+y}$. [1]

c. Change $\frac{a^2-4a}{a^2-16}$ into its lowest terms. [1]

5 Short answers [6]

Write short answers to the following questions.

a. Hari wrote $\frac{x^2+4}{x+2}=x+2$. Is he right? Check with $x=2$ and explain his mistake. [2]

b. Simplify $\frac{1}{x-y} - \frac{1}{x+y}$. **[2]**

c. If $\frac{a}{x-1} + \frac{1}{x+1} = \frac{3x+1}{x^2-1}$, find a. **[2]**

6 Problems [12]

Simplify. Show your working.

a. $\frac{a+b}{a-b} + \frac{a-b}{a+b}$ **[2]**

Answer:

b. $\frac{1}{x^2-5x+6} + \frac{1}{x^2-3x+2} - \frac{2}{x^2-4x+3}$ **[3]**

Answer:

c. Simplify $\frac{1}{x^2-5x+6} + \frac{2}{4x-x^2-3} - \frac{3}{x^2-3x+2}$. **[3]**

Answer:

d. $\frac{1}{a-1} - \frac{1}{a+1} - \frac{2}{a^2+1} - \frac{4}{a^4+1}$ **[4]**

Answer: _____

7 Think [2]

Think, then answer.

A girl walks to school at 4 km/h and runs home along the same road at 12 km/h. Her friend says her average speed is 8 km/h. Find the real average, and explain why it is less than 8.

8 Activity: Check it with numbers (not marked)

Choose three values of x (not 2 or -2) and work out both sides. Fill in the table.

x	$\frac{x}{x-2} - \frac{2}{x+2}$	$\frac{x^2+4}{x^2-4}$

Are the two sides always equal? What happens at $x = 2$?