

# ADDING FRACTIONS

BE CAREFUL !!  
THINK ABOUT IT !!

WE CAN ONLY ADD/SUBTRACT FRACTIONS IF THE NUMBERS ON THE BOTTOM ARE THE SAME.

eg  $\frac{3}{5} + \frac{1}{5} = \frac{4}{5}$

(DENOMINATORS)

IF THE NUMBERS ON THE BOTTOM ARE NOT THE SAME:

- WE NEED TO MAKE THEM THE SAME.
- TO DO THIS, RE-WRITE THE QUESTION AS A SINGLE FRACTION.

STEP 1:  
WORK OUT THE BOTTOM LINE

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

??????

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15

3	5
6	10
9	15
12	20
15	25

SNAP!

← THIS IS THE LOWEST COMMON DENOMINATOR (L.C.D.)

STEP 2: WORK OUT THE TOP LINE

SO WHAT GOES ON TOP?  
DIVIDE THE NEW BOTTOM NUMBER BY THE BOTTOM OF EACH OF THE ORIGINAL FRACTIONS, AND PUT THAT ANSWER OUTSIDE A BRACKET ON THE TOP LINE

5 INTO 15 GOES 3 TIMES

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

$$= \frac{3(\quad) + 5(\quad)}{15}$$

Q. WHAT GOES INSIDE THE BRACKETS ??

A. THE TOP LINE OF EACH OF THE ORIGINAL FRACTIONS.

STEP 3:

$$\left( \frac{1}{5} + \frac{2}{3} \right)$$

$$= \frac{3(1) + 5(2)}{15}$$

$$\frac{3 + 10}{15} = \frac{13}{15}$$

WHAT IF THERE ARE LETTERS AS WELL AS NUMBERS ??

IT'S THE SAME METHOD ! USE THE STEPS + INSTRUCTIONS FROM THE PREVIOUS PAGE TO FOLLOW THESE EXAMPLES.

eg ①  $\frac{x}{2} + \frac{x}{5}$  L.C.D = 10

$$= \frac{5(x) + 2(x)}{10}$$

$$= \frac{5x + 2x}{10} = \boxed{\frac{7x}{10}}$$

eg ②  $\frac{3x-2}{4} + \frac{2x+1}{3}$  L.C.D = 12

$$= \frac{3(3x-2) + 4(2x+1)}{12}$$

$$= \frac{9x-6 + 8x+4}{12}$$

$$= \boxed{\frac{17x-2}{12}}$$

# ALGEBRAIC FRACTIONS

(UGH - EVEN WORSE THAN FRACTIONS!)

Q. WHAT HAPPENS WHEN THE LETTERS ARE ON THE BOTTOM? A. EXACTLY THE SAME.

IF IT'S JUST ONE FRACTION:

- FACTORISE IF YOU CAN
- DIVIDE TOP AND THE BOTTOM BY SAME THING
- OR DIVIDE TOP BY THE BOTTOM.

eg ①  $\frac{a^7}{a^3} = a^4$

②  $\frac{20a^5}{15a^3} = \frac{4a^5}{3a^3} = \frac{4a^2}{3}$

← DIVIDE TOP + BOT BY 5  
← DIVIDE  $a^5$  by  $a^3$   
→ SEE NOTES ON FACTORISING  
**FACTORISING**

③  $\frac{x^2 + 6x + 8}{x + 4}$

→  $\frac{(x+4)(x+2)}{(x+4)}$   
=  $x+2$

IF THERE'S MORE THAN ONE FRACTION :

FIND L.C.D.

[NOW, WE CAN'T REALLY  
FIND L.C.D. OF LETTERS,  
SO WE MULTIPLY THEM TOGETHER]

eg WRITE

$$\frac{1}{x+2} + \frac{1}{x}$$

AS A SINGLE FRACTION.

$$\text{L.C.D.} = (x+2)(x)$$

$$\frac{x(1) + (x+2)(1)}{(x+2)(x)} = \frac{x + x + 2}{(x+2)(x)} = \frac{2x+2}{(x+2)(x)}$$