Fractions: (Numerator/Denominator) 3/4

1. **When adding or subtracting with fractions**
    a. Must have a **common denominator**
        i. Either look for the 1st common multiple of each denominator (lcm)
            1. Multiples are counting by like 6, 12, 18, 24, 30, 36, 42 …
            2. Once have common for both that is new denominator
            3. Example: ¾ + 5/18
                Mult 4: 4, 8, 12, 16, 20, 24, 28, 32, **36**, 40, 44, 48, 52, 56, 60, 64
                Mult 18: 18, **36**, 54, 72, 90, 108
                36 is the 1st one in common so 36 is the common denominator
        ii. Or prime factor each denominator and take each prime factor and its highest power
            1. Prime factors are only divisible by self and 1
                a. (2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89,97,101,103,107,109,113,127…)
                b. Example:
                    i. 4: 2^2
                    ii. 18: $2 * 3^2$
                    iii. So take $2^2 * 3^2 = 36$
    b. Change the numerator
        i. Whatever you multiplied the old denominator by to get new denominator multiply by the old numerator to get the new numerator
            1. Example: ¾ + 5/18
                a. New denominator is 36 so (3*9)/(4*9) + (8*2)/(18*2)
                b. New fractions are 27/36 + 16/36
    c. Combine numerators over the common denominator
        i. Add or subtract the numerators but keep the same common denominator
        ii. Example: 27/36 + 16/36 = (27 + 16)/36 = 43/36
    d. **Reduce** and or write as mixed
        i. If the original problem started out mixed (whole number with a fraction) than answer same
        ii. Always reduce when able (reducing is finding a number that evenly divides in both n/d)
        iii. Example:
            1. 43/36 has no common factor but can be written as mixed : 1 7/36
            2. 12/14 can be reduced by 2 = 6/7 (if can must)
2. **Multiply**:
    a. If mixed change to improper Ex. : 3 4/5 (take den * whole # plus num over same den)(5*3+4)/5= 19/4
    b. Cancel reduce (any top can reduce (divide by same #) any bottom) Ex. 18/14 * 8/9 (2 goes into 8 and 14)
        i. So becomes 18/7 * 4/9 (than 9 goes into both 18 and 9) so 2/7 * 4/1
    c. Multiply straight across: Ex. (2*4)/(7*1) = 8/7
3. **Division:**
    a. If mixed change to improper Ex. : 3 4/5 (take den * whole # plus num over same den)(5*3+4)/5= 19/4
    b. Change from division to multiplication by reciprocal of second fraction
        i. Ex. ¾ / 9/16 change to ¾ * 16/9
    c. Follow b and c of multiplication: ¾ * 16/9 = 1/1 * 4/2 = 1/1 * 2/1 = 2/1 = 2