$$\begin{array}{rr} 4a^2-3b+\ 2c & a^4+2ab+\ b^3 \\ 3a^2+2b-12c & -a^4-2a^2b+3b^3 \\ \hline 7a^2-\ b+10c & -2a^2b+2ab+4b^3 \end{array}$$

CHAP. II.

Of the Subtraction *of* Compound Quantities.

263. If we wish merely to represent subtraction, we enclose each expression within two parentheses, joining, by the sign —, the expression which is to be subtracted, to that from which we have to subtract it.

When we subtract, for example, the expression $d - e + f$ from the expression $a - b + c$, we write the remainder thus:

$$(a - b + c) - (d - e + f);$$

and this method of representing it sufficiently shews which of the two expressions is to be subtracted from the other.

264. But if we wish to perform the actual subtraction, we must observe, first, that when we subtract a positive quantity $+b$ from another quantity a, we obtain $a-b$: and secondly, when we subtract a negative quantity $-b$ from a, we obtain $a + b$; because to free a person from a debt is the same as to give him something.

265. Suppose now it were required to subtract the expression $b - d$ from $a - c$. We first take away b, which gives $a - c - b$: but this is taking away too much by the quantity d, since we had to subtract only $b - d$; we must therefore restore the value of d, and then shall have

$$a - c - b + d;$$

whence it is evident that the terms of the expression to be subtracted must change their signs, and then be joined, with those contrary signs, to the terms of the other expression.

266. Subtraction is therefore easily performed by this rule, since we have only to write the expression from which we are to subtract, joining the other to it without any change beside that of the signs. Thus, in the first example, where it was required to subtract the expression $d - e + f$ from $a - b + c$, we obtain $a - b + c - d + e - f$.

An example in numbers will render this still more clear;

for if we subtract $6 - 2 + 4$ from $9 - 3 + 2$, we evidently obtain

$$9 - 3 + 2 - 6 + 2 - 4 = 0;$$

for $9 - 3 + 2 = 8$; also, $6 - 2 + 4 = 8$; and $8 - 8 = 0$.

267. Subtraction being therefore subject to no difficulty, we have only to remark, that if there are found in the remainder two or more terms, which are entirely similar with regard to the letters, that remainder may be reduced to an abridged form, by the same rules which we have given in addition.

268. Suppose we have to subtract $a - b$ from $a + b$; that is, to take the difference of two numbers from their sum: we shall then have $(a + b) - (a - b)$; but $a - a = 0$, and $b + b = 2b$; the remainder sought is therefore $2b$; that is to say, the double of the less of the two quantities.

269. The following examples will supply the place of further illustrations:

a^2+ab+b^2	$3a-4b+5c$	$a^3+3a^2b+3ab^2+b^3$	$\sqrt{a}+2\sqrt{b}$
$-a^2+ab+b^2$	$2b+4c-6a$	$a^3-3a^2b+3ab^2-b^3$	$\sqrt{a}-3\sqrt{b}$
$2a^2.$	$9a-6b+c.$	$6a^2b+2b^3.$	$5\sqrt{b}.$

CHAP. III.

Of the Multiplication *of* Compound Quantities.

270. When it is only required to represent multiplication, we put each of the expressions, that are to be multiplied together, within two parentheses, and join them to each other, sometimes without any sign, and sometimes placing the sign $\times$ between them. Thus, for example, to represent the product of the two expressions $a - b + c$ and $d - e + f$, we write

$$(a - b + c) \times (d - e + f)$$

or barely, $\quad (a - b + c) \quad (d - e + f)$

which method of expressing products is much used, because it immediately exhibits the factors of which they are composed.

271. But in order to shew how multiplication is actually performed, we may remark, in the first place, that to multiply, for example, a quantity, such as $a - b + c$, by 2,