therefore is equal to the product of $(b+c+a)$ and $(b+c-a)$ Upon substituting the values of b, c, and a the factor $(b+c+a)$ becomes zero.

$\therefore\ b^2+c^2+2bc-a^2=0,$

3. Prove that four times the product of two consecutive integers differs from a square integer by unity.

x and $(x+1)$ are consecutive integers.

$4x(x+1)=$ four times their product $=4x^2+4x$. It is evident that $4x^2$ and $4x$ are the first terms of the square of a binominal. Add one to complete the square and subtract one to leave the value unchanged and

$4x^2+4x=4x^2+4x+1-1=(2x+1)^2-1=$ a square integer -1.

$\therefore\ 4x(x+1)$ differs from a square integer by unity.

4. Solve the equation : $\dfrac{x+1}{x-1}+\dfrac{x+2}{x-2}=\dfrac{2x+6}{x-3}$

Divide each numerator by its denominator and the equation becomes :

$$1+\frac{2}{x-1}+1+\frac{4}{x-2}=2+\frac{12}{x-3}\quad\therefore\ \frac{1}{x-1}+\frac{2}{x-2}=\frac{6}{x-3}$$

Clearing of fractions, and reducing, $3x^2=5x$. Since x is a factor of both sides of the equation, $x=$ zero is one value of x which satisfies the equation. It is evident that the other value is $1\frac{2}{3}$. Also since clearing the original of fractions would give an equation of three dimensions in x, one value of x is infinity.

5. (*a*) Simplify the fraction $\dfrac{(2x-3y)^2-(x-2y)^2}{3x-5y}$

The numerator of the fraction is equal to the difference of two squares.

Hence the fraction $=\dfrac{(2x-3y+x-2y)(2x-3y-x+2y)}{3x-5y}$

$$=\frac{(3x-5y)(x-y)}{3x-5y}=x-y$$

5. (*b*). Factor $7x^2+8xy-12y^2-16x+28y-15$.

(1) Each factor must evidently contain x, y and a numerical term.

(2) The x terms and numerical terms of the factors must, on multiplication, give those terms of the expression which do not contain y. The y terms and numerical terms of the factors must, on multiplication, give those terms which do not contain x.

These considerations lead us to (1) reject in succession the terms containing y and x, and factor the remaining trinomials, and (2) determine by trial whether the x and y terms of the factors thus formed give the term containing xy in the product.

$7x^2-16x-15=(7x+5)(x-3)$; $-12y^2+28y-15=(-6y+5)(2y-3)$

In these factors 5 occurs with $7x$, and also with $-6y$: hence $7x$, $-6y$ and 5 form the factor $(7x-6y+5)$. Similarly, the remaining factor is $(x+2y-3)$. By trial it is evident that the x and y terms of these factors give the term $8xy$ in the product. Hence the given expression can be factored and the factors are $(7x-6y+5)(x+2y-3)$.

6. Find the G. C. M. of x^4-2x^2+3x-2 and $x^4-2x+5x^2-4x+3$.

Evidently the expressions have no common monomial factor. Perform the operations upon the co-efficients alone .(See Dupuis' Algebra)

Let $A=x^4-2x^2+3x-2$	$B=x^4-2x^3+5x^2-4x+3$
A....$1+0-2+3-2$	B....$1-2+5-4+3$
B....$\underline{1-2+5-4+3}$	2B....$2-4+10-8+6$