$$\int \frac{C-Bb}{x^2+2bx+c}\,dx$$

$$(C-Bb)\int \frac{1}{(x+b)^2+(c-b^2)}\,dx \quad (C-Bb)\int \frac{1}{(c-b^2)\left(\left(\frac{x+b}{\sqrt{c-b^2}}\right)^2-1\right)}\,dx \quad g:=\frac{x+b}{\sqrt{c-b^2}}\Rightarrow d\,g=d\,x$$

$$\frac{(C-Bb)}{(c-b^2)}\int \frac{1}{g^2+1}\,d\,g \quad \frac{(C-Bb)}{(c-b^2)}\tan^{-1} g+C \quad \frac{(C-Bb)}{(c-b^2)}\tan^{-1}\frac{x+b}{\sqrt{c-b^2}}+C$$

$$\int \frac{1}{1+x^2}\,dx=\tan^{-1}x+C$$

$$\left(f^{-1}(x)\right)'=\frac{1}{f'\left(f^{-1}(x)\right)}$$

$$\left(\tan^{-1}x\right)'=\frac{1}{\left(\tan\left(\tan^{-1}x\right)\right)'}=\frac{1}{1+\tan^2\left(\tan^{-1}(x)\right)}=\frac{1}{1+x^2}$$

▮

$$\int A\frac{1}{\left(\frac{x+B}{C}\right)^2+1}\,dx=A\,C\tan^{-1}\frac{x+B}{C}$$

$$\left(\tan^{-1}\frac{x+B}{C}\right)'=\frac{1}{1+\left(\frac{x+B}{C}\right)^2}$$

▮