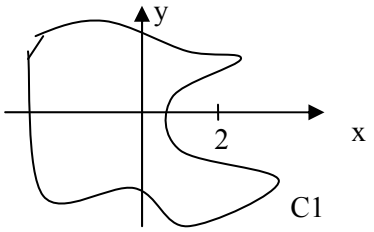
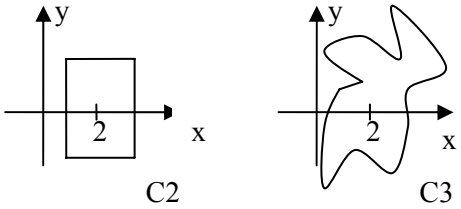
Example CINT-22



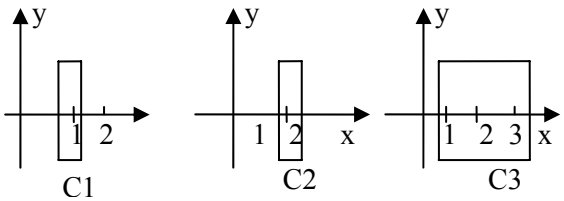
$$\oint_{C1}\frac{1}{z-2}=0,\quad \oint_{C1}\frac{z^2}{z-2}=0,\quad \oint_{C1}\frac{z+2}{z-2}=0,$$



$$\oint_{C2}\frac{1}{z-2}\neq 0,\quad \oint_{C2}\frac{z^2}{z-2}\neq 0,\quad \oint_{C2}\frac{z+2}{z-2}\neq 0,$$

$$\oint_{C3}\frac{1}{z-2}\neq 0,\quad \oint_{C3}\frac{z^2}{z-2}\neq 0,\quad \oint_{C3}\frac{z+2}{z-2}\neq 0,$$

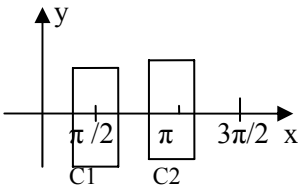
Example CINT-23



$$\oint_{C1}\frac{1}{(z-1)(z-2)(z-3)}\neq 0,\quad \oint_{C2}\frac{1}{(z-1)(z-2)(z-3)}\neq 0,$$

$$\oint_{C3}\frac{1}{(z-1)(z-2)(z-3)}\neq 0,$$

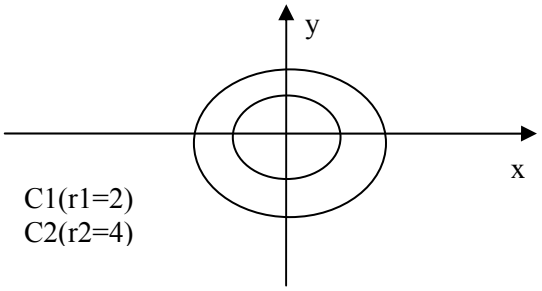
Example CINT-24



$\cos(\pi/2)=0$, $\tan(\pi/2)=$infinity , $\tan(\pi)=0$

$$\oint_{C1}\tan(z)\neq 0\qquad \oint_{C2}\tan(z)=0$$

Example CINT-25



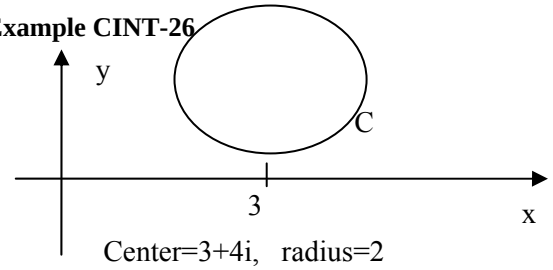
$$\oint_{C1}\frac{1}{z^2-2z+5}=0\qquad \oint_{C2}\frac{1}{z^2-2z+5}\neq 0$$

The roots of z^2-2z+5=0 are z_1=1+2i , z_2=1-2i , and

$|z_1|=|z_2|=\sqrt{1^2+2^2}=\sqrt{5}=2.23$

2.23>r1 but 2.23<4

Example CINT-26



Center=3+4i, radius=2

$$\oint_{C}\frac{1}{z^2-2z+5}=0,$$ The roots of z^2-2z+5=0 are

z_1=1+2i , z_2=1-2i , $|z_1-(3+4i)|=|1+2i-(3+4i)|=$

$=|1+2i-3-4i|=|-2-2i|=\sqrt{2^2+2^2}=2.82$

2.82>radius So the point 1+2i is outside of the circle and the integration is zero

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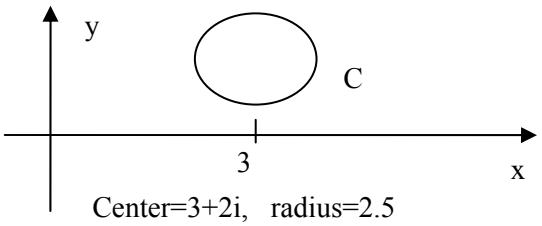
Example CINT-27



Center=3+2i, radius=2.5

$$\oint_{C}\frac{1}{z^2-2z+5}\neq 0,$$ The roots of z^2-2z+5=0 are

z_1=1+2i , z_2=1-2i , $|z_1-(3+2i)|=|1+2i-(3+2i)|=$

$|1+2i-3-2i|=|-2|=\sqrt{2^2+0^2}=2$

2<radius So the point 1+2i is inside the circle and the integration is not zero