20.21 (1, 2, 3, 4, 5, 6, 7, 8, 9)

1)
$$\frac{z}{(z+2)^2}$$
 $z_0 = -2$
 $t = z+2$: $t-2 = 1$ $t-2$ $t^2 = (z+2)^2 + z+2$

2) $\frac{e^z+1}{e^z-1}$ $z_0 = 2\pi i k$ $k \in \mathbb{Z}_1$

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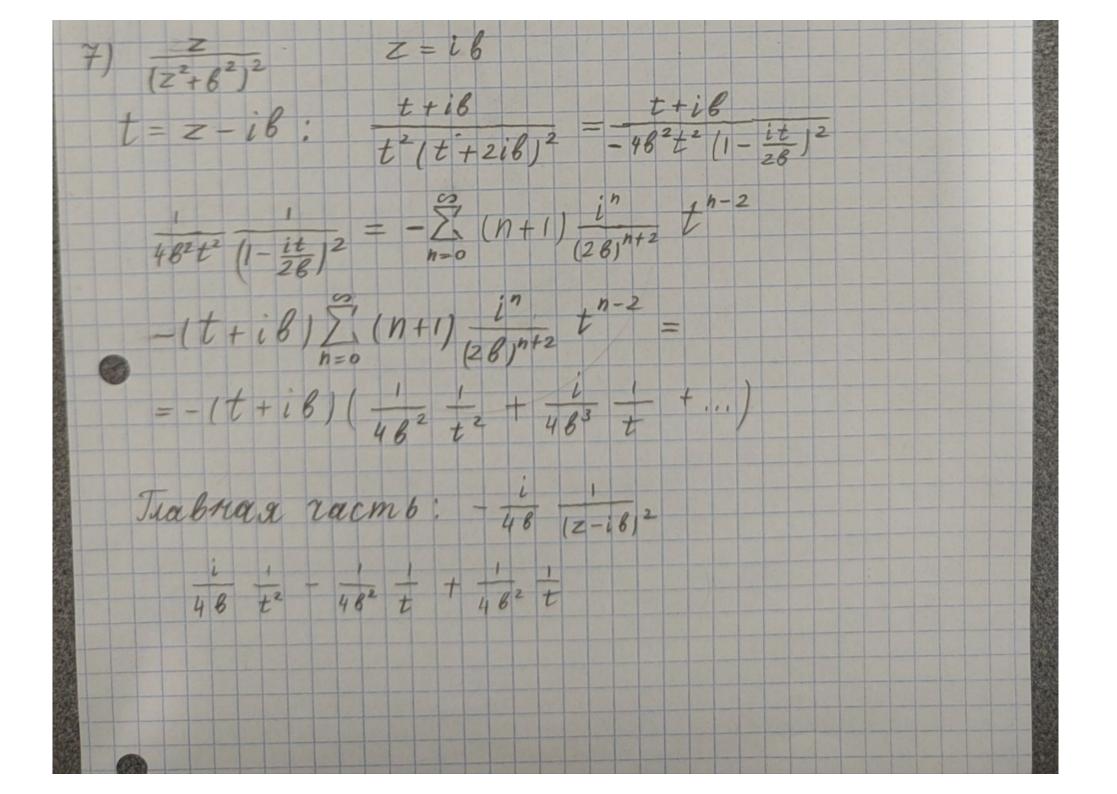
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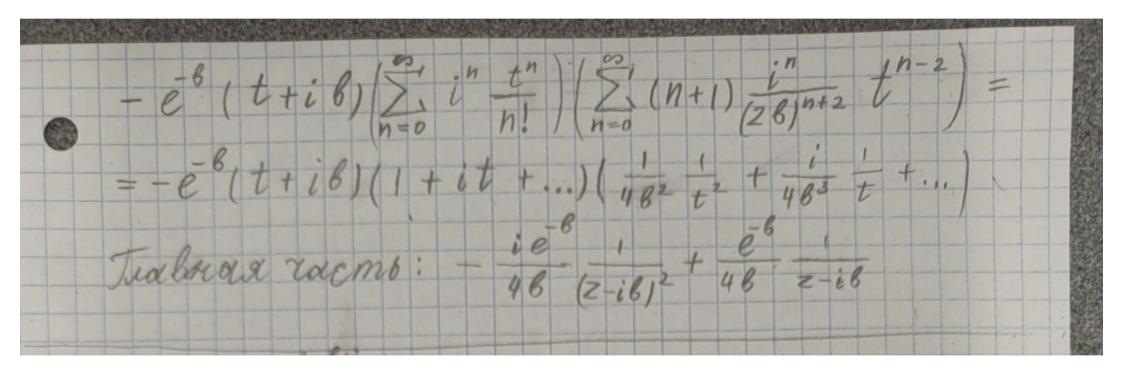
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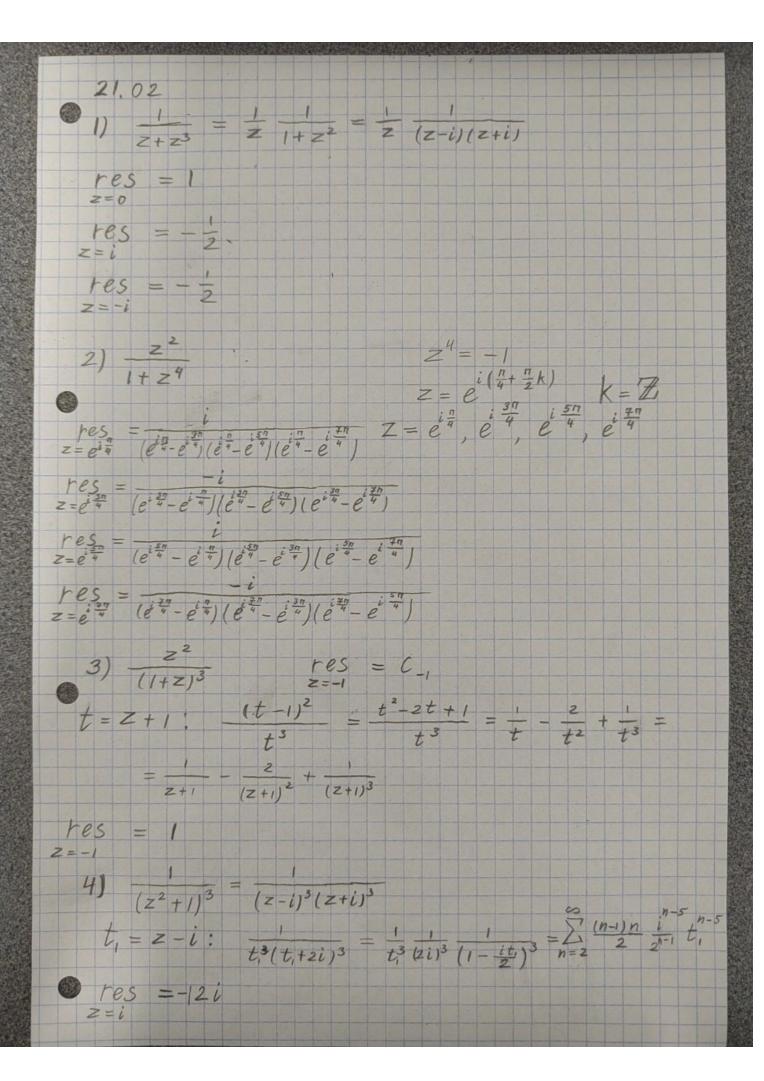
3) $\frac{e^z}{e^z-1}$ $\frac{e^z}{e^z-$

 $\frac{e^{6}}{t^{2}(t+26i)^{2}} = \frac{e^{6}}{46^{2}t^{2}\cdot(1-it)^{2}} = \frac{e^{6}}{48^{2}} + \frac{1}{12} + \frac{1$ $-e^{6}\left(\frac{1}{(28)^{2}} + \frac{1}{2} + \frac{1}{48^{3}} + \dots\right) \left(1 + it + \dots\right)$ Trabonan $z \propto cm 6: -\frac{e^{6}}{48^{2}} + \frac{e^{6}(i + 6i)}{48^{2}} + \frac{1}{2 - i8}$ $t = \frac{1}{z}: \frac{(\frac{1}{z^2} + 1)^2}{\frac{1}{z^2} + \beta^2} = \frac{(1 + t^2)^2}{t^2 + \beta^2} = \frac{1}{t^2 + \beta^2} + \frac{1}{t^2 + \beta^2} = \frac{1}{t^2 + 2 + 2} = \frac{1}{t^2 + 2 + 2 + 2 + 2} = \frac{1}{t^2 + 2 + 2 + 2 + 2} = \frac{1}{t^2 + 2 + 2 + 2 + 2} = \frac{1}{t^2 + 2 + 2 + 2 + 2} = \frac{1}{t^2 + 2 + 2 + 2 + 2} = \frac{1}{t^2 + 2 + 2 + 2 + 2} = \frac{1}{t^2 + 2 + 2 + 2 + 2} = \frac{1}{t^2 + 2 + 2 + 2 + 2} = \frac{1}{t^2 + 2 + 2 + 2 + 2} = \frac{1}{t^2 + 2 + 2 + 2 + 2} = \frac{1}{t^2 + 2 + 2 + 2 + 2} = \frac{1}{t^2 + 2 + 2 + 2 + 2} = \frac{1}{t^2 + 2 + 2 + 2 + 2} = \frac{1}{t^2 + 2 + 2 + 2 + 2} = \frac{1}{t^2 + 2 + 2 + 2 + 2} = \frac{1}{t^2 + 2 + 2 + 2 + 2 + 2} = \frac{1}{t^2 + 2 + 2 + 2 + 2} = \frac{1}{t^2 + 2 + 2 + 2 + 2} = \frac{1}{t^2 +$ $\left(\frac{1}{t^2} + 2 + t^2\right) \left(1 - \beta^2 t^2 + \dots\right)$ Trabuar racmb: Z2 6) $\frac{z \cdot e^{iz}}{(z^2 + \theta^2)^2}$ $z = i\theta$ $\theta > 0$ $t = z - i\theta$: $(t + i\theta) \cdot e^{it} \cdot e^{\theta}$ t2 (t+28i)2 $e^{it} = \sum_{n=1}^{\infty} i^n \frac{t^n}{n!}$ $t^{2}(t+26i)^{2} = \frac{1}{46^{2}t^{2}} \cdot \frac{1}{1-\frac{i}{26}} \cdot \frac{1}{26} = \frac{1}{46^{2}t^{2}} \cdot \frac{1}{1-\frac{i}{26}} \cdot \frac{1}{1-\frac{i}{26}}$ $=-\sum_{n=0}^{\infty}(n+1)\frac{i^{n}}{(28)^{n+2}}t^{n-2}$





8)	ctg 172	zeZ		
	Trabraa ra	cm6: 1(z-k)	$k \in \mathbb{Z}$	
9)	sin nz = cosec	nz zeZ		
	Trabuar rac	m6:	$k \in \mathbb{Z}$	



t, = 2+	$\ddot{l}: \frac{1}{t^3(t-2i)^3} = 1.$	
res = z=-i	120	
5) -1 (z2+1)	$(z-1)^{2} = (z-i)(z+i)(z-1)^{2}$	
res =	$\frac{1}{2i(i+1)^2} = \frac{1}{4}$	
tes = -	-2i(-i-1) ² = ¹ / ₄	
res = 0 $z=1$	$-res - res = -\frac{1}{2}$ $z = i$ $z = -i$	0