

Panel 13

Homework:

① How many Laurent series centered at  $c=0$  does the function  $f(z) = \frac{1}{z^2 - 3z - 4}$  have and where do they converge. Find them.

② Find a Laurent series centered at  $c=0$  for

$$f(z) = \frac{1}{z^3 - z^4}$$

④ Find a Laurent series for  $\sinh\left(\frac{1}{z}\right)$  centered at  $c=0$

⑤ Find a Laurent series for  $f(z) = \frac{\sin(2z)}{z^4}$  centered at  $c=0$ .

⑥ Show that  $\frac{1-z}{z-3} = -\sum_{n=0}^{\infty} \frac{z^n}{(z-1)^n}$  is valid for  $|z-1| > 2$

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⇒

Panel 14

Home work (continued)

$$(7) \text{ Suppose } \frac{1}{z^2 - \sqrt{6} + 6} = \sum_{n=-\infty}^{\infty} a_n z^n \quad \forall r < |z| < R$$

Find  $r$  and  $R$ 

$$(8) \text{ Find a Taylor series for } f(z) = \frac{1}{1-z} \text{ centered at } c = 2$$

$$(9) \text{ Find the Laurent series for } f(z) = \frac{1}{1-z} \text{ centered at } c = i \text{ that converges for } |z - i| > \sqrt{2}$$