

Panel 9

Homework

① Find  $f(1+i)$  for (a)  $f(z) = z + z^{-1} + 5$  (b)  $f(z) = 4z\bar{z}$

② Let  $f(z) = z^{21} - 5z^7 + 9z^4$ . Find  $f(-1+i)$

③ Express in the form  $f(z) = u(x,y) + iv(x,y)$  for

(a)  $f(z) = z^3$  (b)  $f(z) = \bar{z}^2 + (2-3i)z$

④ Let  $f(z) = (3+4i)z - 2ti$ . Find the image of

(a) the line  $x(t) = t, y(t) = 1-2t$

(b) the image of the disk  $|z-1| < 1$

⑤ Let  $f(z) = (2+i)z - 2i$ . Find image of the triangle

with vertices  $z_1 = -2+i, z_2 = -2+2i, z_3 = 2+2i$

⑥ What is the image of a horizontal line through  $(1,1)$  under  $f(z) = z^2$ . What about a vertical line?