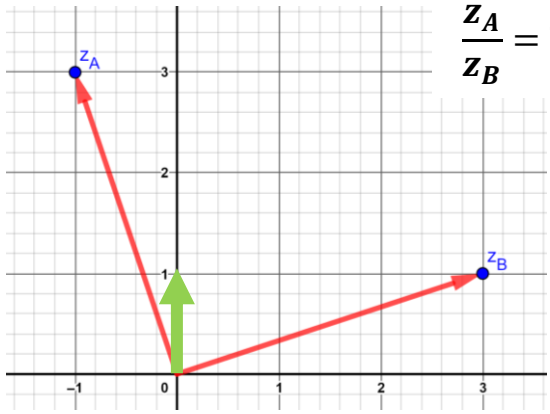
TD –

OPERATIONS SOUS FORME ALGEBRIQUE



$\frac{z_A}{z_B} = ?$

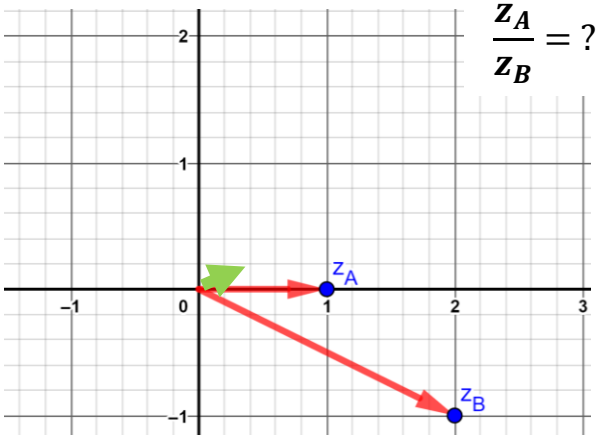
$z_A = -1 + 3i$ $\quad$ $z_B = 3 + i$

$$\frac{-1+3i}{3+i} = \frac{(-1+3i)(3-i)}{(3+i)(3-i)}$$

$$= \frac{-3+i+9i-3i^2}{3^2+1^2}$$

$$= \frac{-3+10i+3}{10}$$

$$= \frac{10\,i}{10} = i$$



$\frac{z_A}{z_B} = ?$

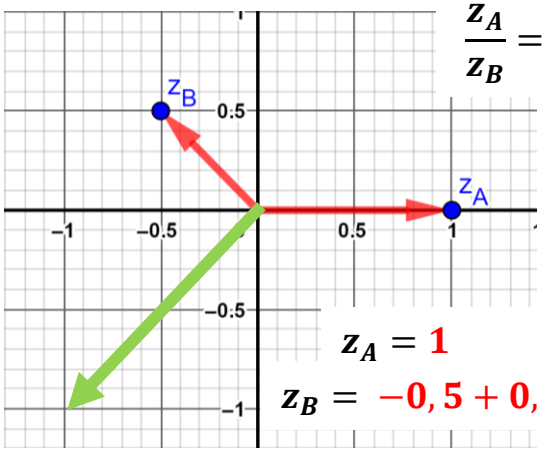
$z_A = 1$ $\quad$ $z_B = 2 - i$

$$\frac{1}{2-i} = \frac{1 \times (2+i)}{(2-i)(2+i)}$$

$$= \frac{2+i}{2^2+(-1)^2}$$

$$= \frac{2+i}{5}$$

$$= \frac{2}{5} + \frac{1}{5}i = 0{,}4 + 0{,}2\,i$$



$\frac{z_A}{z_B} = ?$

$z_A = 1$

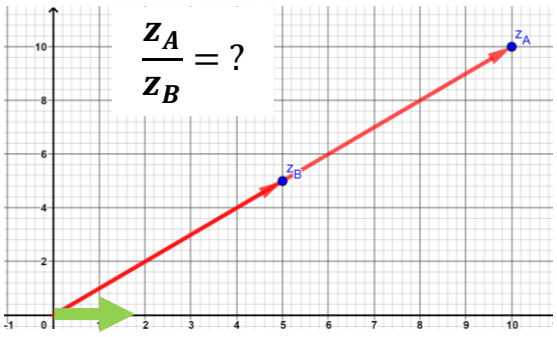
$z_B = -0,5 + 0,5i$

$$\frac{1}{-0{,}5+0{,}5i} = \frac{1 \times (-0{,}5-0{,}5i)}{(-0{,}5+0{,}5i)(-0{,}5-0{,}5i)}$$

$$= \frac{-0{,}5-0{,}5i}{(-0{,}5)^2+0{,}5^2}$$

$$= \frac{-0{,}5-0{,}5i}{0{,}5}$$

$$= \frac{-0{,}5}{0{,}5} - \frac{0{,}5}{0{,}5}i = -1 - i$$



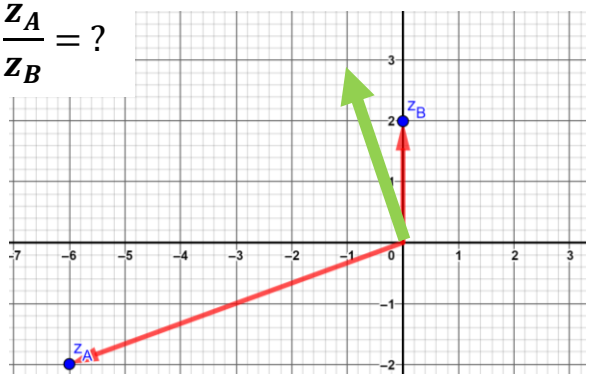
$\frac{z_A}{z_B} = ?$

$z_A = 10 + 10i$ $\quad$ $z_B = 5 + 5i$

$$\frac{10+10i}{5+5i} = \frac{2\,(5+5i)}{(5+5i)} = 2$$

On peut aussi faire une division classique pour finalement arriver sur le même résultat.

$\frac{z_A}{z_B} = ?$



$z_A = -6 - 2i$ $z_B = 2i$

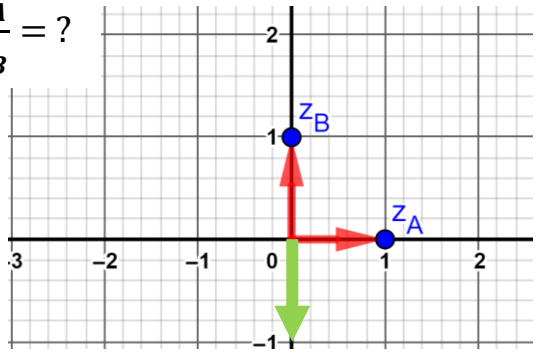
$$\frac{-6-2i}{2i} = \frac{(-6-2i)\times(-2i)}{2i \times (-2i)}$$

$$= \frac{12i + 4i^2}{4}$$

$$= \frac{-4 + 12i}{4}$$

$$= -\frac{4}{4} + \frac{12}{4}i = -1 + 3i$$

$\frac{z_A}{z_B} = ?$



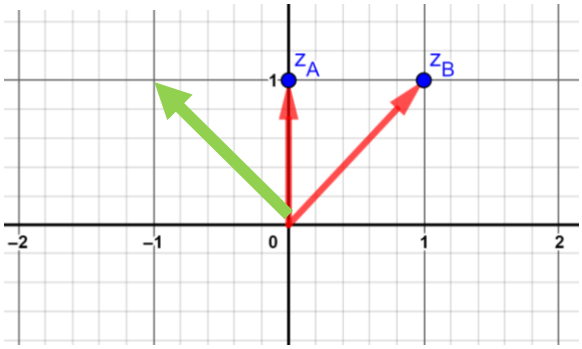
$z_A = 1$ $z_B = i$

$$\frac{1}{i} = \frac{1\times(-i)}{i \times (-i)}$$

$$= \frac{-i}{1}$$

$$= -i$$

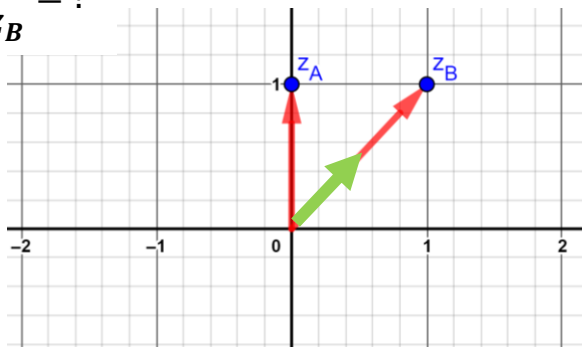
$z_A \times z_B = ?$



$z_A = i$ $z_B = 1 + i$

$$i\,(1+i) = i + i^2 = -1 + i$$

$\frac{z_A}{z_B} = ?$



$z_A = i$ $z_B = 1 + i$

$$\frac{i}{(1+i)} = \frac{i\times(1-i)}{(1+i)(1-i)}$$

$$= \frac{i - i^2}{1^2 + 1^2}$$

$$= \frac{i - (-1)}{2}$$

$$= \frac{1}{2} + \frac{1}{2}i = 0{,}5 + 0{,}5i$$