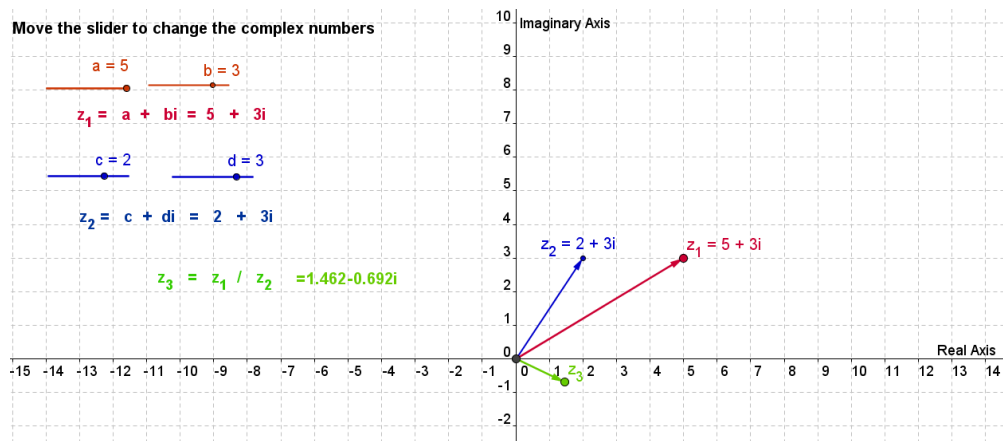


## Student Activity: To investigate division of complex numbers

Use in connection with the interactive file, 'Division of complex numbers' and 'Division of complex numbers 2', on the Student's CD.



- Calculate  $z_1$  divided by  $z_2$  in each of the following cases and check your answer using the interactive file.

		$\frac{z_1}{z_2}$
a.	$z_1 = 2$ and $z_2 = 1 + 4i$	
b.	$z_1 = 2 + 4i$ and $z_2 = 1 - 3i$	
c.	$z_1 = -3 + 4i$ and $z_2 = 1 - 2i$	
d.	$z_1 = i$ and $z_2 = 2 + i$	

e.	$z_1 = i$ and $z_2 = i$	
f.	$z_1 = -1 - i$ and $z_2 = -2 - i$	
g.	$z_1 = 1 + \sqrt{25}i$ and $z_2 = -2 + \sqrt{9}i$	

2. Given two complex numbers explain how you calculate  $\frac{z_1}{z_2}$ .

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3. If  $z = a + bi$ , calculate  $\frac{z}{\bar{z}}$  where  $\bar{z}$  is the complex conjugate of  $z$ .

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4. If  $z_1 = -1 - i$  and  $z_2 = -2 - i$  investigate whether  $\frac{z_2}{z_1} = \frac{z_1}{z_2}$ ?

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5. When dividing complex numbers, what do you multiply the numerator and denominator by? Explain why you do this.

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6. If  $(3 + 4i)(x + yi) = 5 + 2i$ , find  $x$  and  $y$ .

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7. If  $(2 - 3i)(x + yi) = 5 + 4i$ , find  $x$  and  $y$ .

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8. Calculate  $\left| \frac{2 + 3i}{i} \right|$ .

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9. Calculate  $\left| \frac{1 + i}{1 - i} \right|$ .

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10. Using the interactive file investigate whether, when one complex number is divided by another, the difference between the angles they make with the Real Axis is equal to the angle the quotient makes with the Real Axis. Do you think that this is true in general?

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