Student Activity: To investigate the complex conjugate
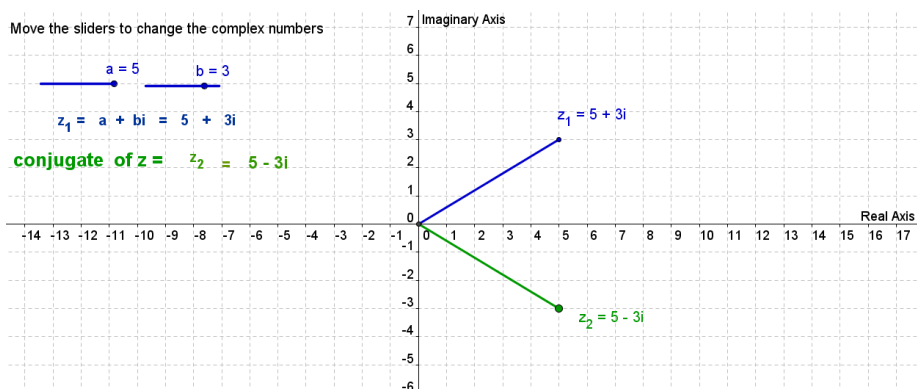
Use in connection with the interactive file, 'Complex conjugate', on the Student's CD.

Move the sliders to change the complex numbers

$a = 5$ $b = 3$

$z_1 = a + bi = 5 + 3i$

conjugate of z = $z_2 = 5 - 3i$

$z_1 = 5 + 3i$

$z_2 = 5 - 3i$

N.B. Note the complex conjugate of a complex number z is written as $\bar{z}$

1. Find the complex conjugate of the following numbers and check your answers using the interactive file.

		Calculate $\bar{z}$.
a.	$z_1 = 3 + 2i$	
b.	$z_1 = 2 + 3i$	
c.	$z_1 = 1 - 3i$	
d.	$z_1 = -1 - 2i$	
e.	$z_1 = -3 + 4i$	
f.	$z_1 = -i$	
g.	$z_1 = 4$	
h.	$z_1 = -1 - i$	
i.	$z_1 = 1 + \sqrt{25}\, i$ and $z_2 = -2 - \sqrt{36}\, i$	

2. On the Argand diagram, which transformation gives the conjugate of a complex number?

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3. If 2-4i is the complex conjugate of Z_1, what is Z_1?

_____

4. Does every complex number have a unique complex conjugate? Explain.

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5. Is the modulus of a complex number equal to the modulus of its complex conjugate? Explain your answer.

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_____

6. What type of number do you always get when you add a complex number to its conjugate?

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7. What can you say about two complex numbers if the sum of these two complex numbers is real?

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8. What type of number do you always get when you subtract a number's complex conjugate from that number?

_____

9. Multiply 2+3i by its complex conjugate. What do you notice?

_____

_____

10.

    a. Multiply a + bi by its complex conjugate. What do you notice?

    _____

    _____

    b. Is this always the case when you multiply a complex number by its complex conjugate?

    _____

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