# Worksheet

## Complex numbers

Exercise 1

Add and write the result in standard form.

 $a) \left(3+5i\right)+(4+6i)$ $b) \left(-4+6i\right)-(-7+5i)$

 $c) \left(-0,2-1,1i\right)+(-0,8-1,9i)$ $d)\left(1\frac{3}{4}-2,5i\right)-\left(\frac{1}{3}-0,5i\right)$

Exercise 2

Add or subtract as indicated and write the result in standard form.

 $a) \left(1+i\right)+\left(2-3i\right)-(3+4i)$ $b) \left(0,4-4,2i\right)-\left(1,5+0,6i\right)+3,3i$

 $c) \left(\frac{1}{2}-\frac{2}{3 } i\right)+\left(\frac{2}{3}-\frac{3}{4} i\right)-\left(\frac{3}{4} \frac{5}{6} i\right)$ $d) \left[0,\left(3\right)+1,1\left(6\right)i\right]-\left[0,1\left(3\right)-0,\left(2\right)i\right]$

Exercise 3

Find each product and write the result in standard form.

 $a) (3+2i)(4-5i)$ $b) (5-6i)(1-3i)$ $ c) (1-i)(1+i)$

 $d) \left(1-i\right)\left(3+4i\right)$ $e) (-5i-4)(3-i)$ $f) (2-2i)(4i+5)$

Exercise 4

Find each product and write the result in standard form.

 $a) \left(1+2\sqrt{3} i\right)\left(2-3\sqrt{3} i\right) b) 2i(1-\sqrt{3} i)(1+\sqrt{3} i)$

 $c) \left(6-7i\right)\left(5+5\right)\left(3-5i\right) d) 2i(7+10i)(2-4i)$

 $e) \left(2-3i\right)\left(-1-i\right)\left(3+4i\right) f) (5+4i)(-2-i)(5-4i)(-2+1)$

Exercise 5

Divide and express the result in standard form.

 $a)\frac{1}{1 + i} b) \frac{3 + i}{3 - i } c) \frac{2i - 3}{1 - 3i} d) \frac{3 - 5i}{2 + 3i}$

 $e) \frac{1 + \sqrt{3} i}{1 - \sqrt{3} i} f)\frac{1 + \sqrt{15} i}{1 - \sqrt{3} i} g) \frac{\sqrt{6 }- i}{\sqrt{6} -2i} h) \frac{1 + 2i}{1+ \sqrt{2}i }$

Exercise 6

Write the complex number in polar form.You may express the argument in

degrees or radians.

a) 1 b) 3*i* c) -2*i* d) -*i*

e) 6*i* f) -2 g) *i* h) -5*i*

Exercise 7

Write the complex number in polar form.You may express the argument in

degrees or radians.

a) 3 + i b) -3 - i c) 6 + 6i d) 6 - 6i

e) -6 + 8i f) 2,7 - 3,2i g) 1,8 + 0,52i

h) 2,7 -1,32i

Exercise 8

Find the product and quotient of the complex numbers. Leave answers in polar form.

 a) z = 4(cos 70° + isin 70°) w = 2(cos 40° + isin 40°)

b) z = 8(cos 80° + isin 20°) w = 4(cos 80° + isin 20°)

c) z = 14(cos 3π/2 + isin3π/2) w = 7(cos 5π4 + isin 5π/4)

d) z = 15(cos 4π/3 + isin4π/3) w = 5[(cos (-60°) + isin(-60°)