

8. Exercises

Exercise 1

Add and write the result in standard form.

$$a) (3 + 5i) + (4 + 6i)$$

$$b) (-4 + 6i) - (-7 + 5i)$$

$$c) (-0,2 - 1,1i) + (-0,8 - 1,9i)$$

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

Exercise 2

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

$$a) (1 + i) + (2 - 3i) - (3 + 4i)$$

$$b) (0,4 - 4,2i) - (1,5 + 0,6i) + 3,3i$$

$$c) \left(\frac{1}{2} - \frac{2}{3}i\right) + \left(\frac{2}{3} - \frac{3}{4}i\right) - \left(\frac{3}{4} - \frac{5}{6}i\right)$$

$$d) [0, (3) + 1,1(6)i] - [0,1(3) - 0, (2)i]$$

Exercise 3

Find each product and write the result in standard form.

$$a) (3 + 2i)(4 - 5i)$$

$$b) (5 - 6i)(1 - 3i)$$

$$c) (1 - i)(1 + i)$$

$$d) (1 - i)(3 + 4i)$$

$$e) (-5i - 4)(3 - i)$$

$$f) (2 - 2i)(4i + 5)$$

Exercise 4

Find each product and write the result in standard form.

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

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

$$c) (6 - 7i)(5 + 5i)(3 - 5i)$$

$$d) 2i(7 + 10i)(2 - 4i)$$

$$e) (2 - 3i)(-1 - i)(3 + 4i)$$

$$f) (5 + 4i)(-2 - i)(5 - 4i)(-2 + 1)$$

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.

$$a) 1$$

$$b) 3i$$

$$c) -2i$$

$$d) -i$$

$$e) 6i$$

$$f) -2$$

$$g) i$$

$$h) -5i$$

Exercise 7

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

$$a) 3 + i$$

$$b) -3 - i$$

$$c) 6 + 6i3$$

$$d) 6 - 6i3$$

$$e) -6 + 8i$$

$$f) 2.7 - 3.2i$$

$$g) 1.8 + 0.52i$$

$$h) 2.7 - 1.32i$$

Exercise 8

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

- a) $z = 4(\cos 70^\circ + i \sin 70^\circ)$ $w = 2(\cos 40^\circ + i \sin 40^\circ)$
- b) $z = 8(\cos 80^\circ + i \sin 20^\circ)$ $w = 4(\cos 80^\circ + i \sin 20^\circ)$
- c) $z = 14(\cos 3\pi/2 + i \sin 3\pi/2)$ $w = 7(\cos 5\pi/4 + i \sin 5\pi/4)$
- d) $z = 15(\cos 4\pi/3 + i \sin 4\pi/3)$ $w = 5[(\cos (-60^\circ) + i \sin (-60^\circ))]$

9. Homework

Finish exercises we didn't do in class.