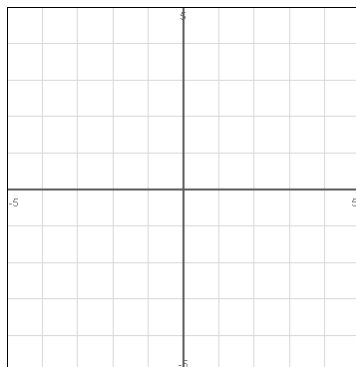


Complex Numbers

Complex Number - If a and b are real numbers, then the number $a + bi$ is a complex number.

$$3 + 2i$$



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

$$i^2 = -1$$

$$i^3 = -i$$

$$i^4 = 1$$

1. Solve for a and b .

a) $a + bi = 3 - 6i$

b) $(a - 2) + 3bi = 5 + 9i$

2. Write in standard form.

a) $6 + \sqrt{-16}$

b) 7

c) $\sqrt{-20}$

d) $-8i - 4i^2$

3. Add or subtract the complex numbers and write the answer in standard form.

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

b) $(-7 - \sqrt{-72}) - (4 - \sqrt{-98})$

4. Multiply the complex numbers and write the answer in standard form.

a) $\sqrt{-5} \cdot \sqrt{-10}$

b) $(\sqrt{-32})^2$

c) $(6 - 2i)(-4 + 3i)$

d) $-6i(8 - 3i)$

e) $(\sqrt{12} + \sqrt{10}i)(\sqrt{12} - \sqrt{10}i)$

f) $(5 - \sqrt{-6})(3 + \sqrt{-12})$

g) $(3 + 6i)^2$

h) $(1 - 2i)^2 - (1 + 2i)^2$

5. Divide and write the answer in standard form.

a) $-\frac{2}{i}$

b) $\frac{8-7i}{2i}$

c) $\frac{3}{2-i}$

d) $\frac{3-2i}{5+6i}$

$$\text{e) } \frac{3i(1-2i)}{4-i}$$

$$\text{f) } \frac{2i}{3+i} - \frac{6}{3-i}$$

6. Simplify and write the answer in standard form.

a) i^{23}

b) $7i^2 - 3i^{33}$

c) $(\sqrt{-3})^6$

d) $\frac{1}{(2i)^7}$