

Imaginary / Complex Numbers Practice

Name Key
Date _____

1. For the complex number $-10+4i$, identify the real number and the imaginary number.

2. Evaluate.

a) i^2	b) i^3	c) i^4	d) i^9	e) i^{14}
-1	-i	1	i	-1

3. Write the expression as a complex number in standard form.

a) $(5+2i)+(3-2i)$
8

b) $-i+(7-5i)-3(2-3i)$
-i + 7 - 5i - 6 + 9i
1 + 3i

c) $(-2+4i)+(3-9i)$
1 - 5i

d) $(-2+4i)-(3+9i)$
-5 - 5i

e) $(5-2i)-2(3+i)$
-1 - 2i - 2i
-1 - 4i

f) $3i(6-5i)$
18i - 15i²
18i - 15(-1)
15 + 18i

g) $i(2+i)$

2i + i²

2i - 1

$-1 + 2i$

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

2 - 8i + 3i - 12i²

2 - 5i - 12(-1)

2 + 12 - 5i

$14 - 5i$

i) $(-3+7i)(1-2i)$

-3 + 6i + 7i - 14i²

-3 + 13i - 14(-1)

-3 + 14 + 13i

$11 + 13i$

j) $(3-2i)^2$

$(3-2i)(3-2i)$

9 - 6i - 6i + 4i²

9 - 12i - 4

$5 - 12i$

k) $(2i)(1-4i)(1+i)$

2i [1+i - 4i - 4i²]

2i [1 - 3i + 4]

2i [5 - 3i]

10i - 6i²

$6 + 10i$

4. Solve each equation.

$$a) \sqrt{x^2} = \sqrt{-60}$$

$$x = \pm i \sqrt{60}$$

\wedge
 15 4

$$x = \boxed{\pm 2i \sqrt{15}}$$

(22)

$$b) 4x^2 + 20 = 0$$

$$\quad \quad -20 \quad -20$$

$$\frac{4x^2}{4} = \frac{-20}{4}$$

$$\sqrt{x^2} = \sqrt{-5}$$

$$x = \boxed{\pm i \sqrt{5}}$$

$$c) 6x^2 + 1 = -5$$

$$\frac{6x^2}{6} = \frac{-6}{6}$$

$$\sqrt{x^2} = \sqrt{-1}$$

$$x = \boxed{\pm i}$$

$$d) \frac{3(x-1)^2}{3} = \frac{-27}{3}$$

$$\sqrt{(x-1)^2} = \pm \sqrt{-9}$$

$$x-1 = \pm 3i$$

$\pm i$ $\pm i$

$$x = \boxed{1 \pm 3i}$$

$$e) (x+5)^2 + 10 = 2$$

$$\quad \quad -10 \quad -10$$

$$\sqrt{(x+5)^2} = \sqrt{-8}$$

$$x+5 = \pm i \sqrt{8}$$

\wedge
 4 2
 (22)

$$x+5 = \pm 2i \sqrt{2}$$

-5 -5

$$x = \boxed{-5 \pm 2i \sqrt{2}}$$

$$f) \frac{5(2x+8)^2}{5} = \frac{-80}{5}$$

$$\sqrt{(2x+8)^2} = \sqrt{-16}$$

$$2x+8 = \pm i \sqrt{16}$$

$$2x+8 = \pm 4i$$

-8 -8

$$\frac{2x}{2} = \frac{-8 \pm 4i}{2}$$

$$x = \boxed{-4 \pm 2i}$$

Answers

1. Real number: -10; Imaginary number: 4i

2. ~~A) 2-4i B) -7i C) 5 D) 3+2i~~

3. ~~a) -1 b) -i c) 1 d) i e) -1~~

3. ~~a) 8 b) 1+3i c) 1-5i d) -5-5i e) -1-4i f) 15+18i~~