Complex Numbers- Use of a + bi   Name_____

1. Give the absolute value of each complex number.

A. (3,4)   B. (-2,0)   C. [17,90°]   D. [17,21.2°]

$\sqrt{3^2+4^2}$

5   2   17   17

2. Simplify

A. |(-1,2)| B. |[12,3°]| C. |(-4,-4)| D. |(0,0)|

$\sqrt{1^2+2^2}$ $\sqrt{4^2+4^2}$

$\sqrt{5}$ 12 $\sqrt{32}$ 0

3. How many complex numbers have absolute value 0? ___1___

4. How many complex numbers have absolute value 1? ___∞___

5. Consider the following complex numbers:

     a. (0,8)   b. (1,7)   c. (2,6)   d. (3,5)   e. (4,4)

A. Which has the largest absolute value? ___a___

B. Which has the smallest absolute value? ___e___

C. Which can also be denoted by [8,90°]? ___a___

D. Which can also be denoted by [4√2, 45°]? ___e___

6. If you wished to calculate the absolute value of a complex number, would you prefer that the number be represented with polar coordinates or with rectangular coordinates?

7. Write each complex number in a + bi notation

   A. (6,4)   6+4i   B. (0,1)   0 + i

8. In a + bi notation, what would be the values of a and b?

A. 9i + 5   B. 7i   C. 0 - i√3   D. [3, 180°]

  a=5   a=0   a=0   a=-3
  b=9   b=7   b=-√3   b=0

9. Write the given number in a + bi form

A. [½, 30°] ($\frac{1}{2}\cos 30°$, $\frac{1}{2}\sin 30°$)   B. [3.2, 70°] (3.2cos70°, 3.2 sin70°)

$\frac{1}{4}\sqrt{3} + \frac{1}{4}i$ 1.09 + 3.01i

10. Graph each point and draw an arrow from the origin to the point. Find the sum and graph that point and an arrow from the origin to that sum. Complete the parallelogram.

A. $(-7 + i)$ $(3 + 5i)$ Sum: $-4 + 6i$

B. $(-3 + -8i)$ $(-4 + 5i)$ Sum: $-7 - 3i$

$(-1) = i$
i^2
i^3
$-i = i$
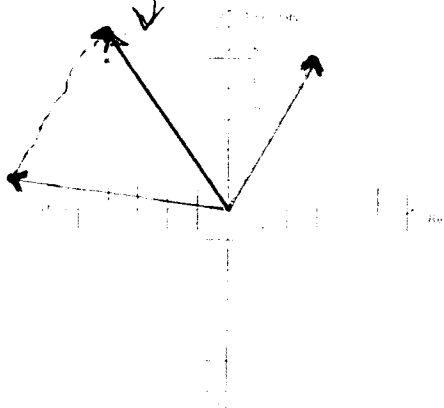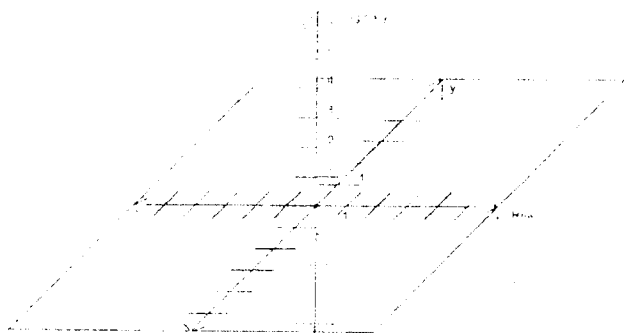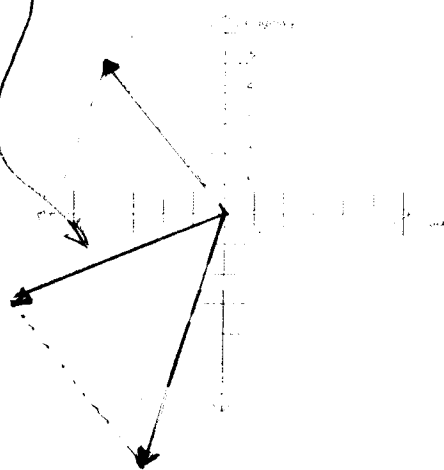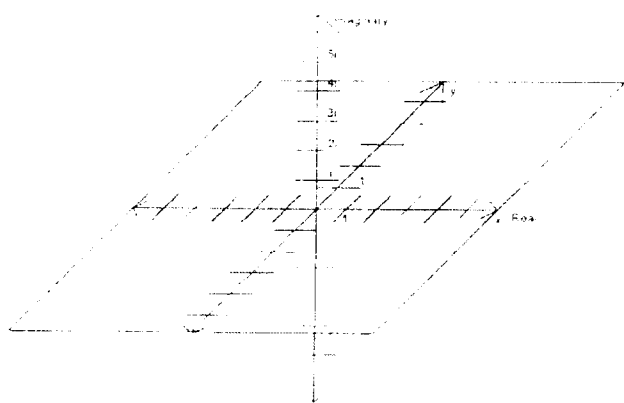
11. Simplify the following:

A. $(\sqrt{-6})(\sqrt{-6})$

$(i\sqrt{6})(i\sqrt{6})$

$i^2\sqrt{36}$

$(-1)(6)$

$\boxed{-6}$

B. $(-i\sqrt{6})$

$i^3\sqrt{6}$

already
simplified

C. $(4 - 6i)^2$

$(4 - 6i)(4 - 6i)$

$16 - 24i - 24i + 36i^2$

$16 - 48i - 36$

$\boxed{-20 - 48i}$

D. $\sqrt{-9}$

$i\sqrt{9}$

E. $(7i)^2$

$49i^2$

-49

F. $(9 + 2i) + (1 - 7i)$

$10 - 5i$

G. $(5 - 7i) - (8 + 2i)$

$-3 - 9i$

H. $i(3 + 4i)$

$3i + 4i^2$

$3i - 4$

$-4 + 3i$