Accelerated Geometry

Name_____

Complex Number Practice

Date_____ Period____

Simplify.

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

2) $2+7+(-6-6i)$ = $3-6i$

3) $(6-8i)-(8-i)$ → $6-8i-8+i$ = $-2-7i$

4) $(-2-5i)-(-3+3i)$ → $-2-5i+3-3i$ = $1-8i$

5) $(8i)+(6+4i)+(7i)$ = $6+19i$

6) $(-7-8i)-(-5-8i)$ → $-7-8i+5+8i$ = -2

7) $(-i)(-6i)(3-8i)$ → $-6(3-8i)$

$6i^2=-6$ $-18+48i$

8) $(-8+8i)^2$ → $(-8+8i)(-8+8i)$

$64-64i-64i+64i^2$ -64 = $-128i$

9) $(3+i)(-6-i)$ → $-18-3i-6i-i^2$ $+1$

= $-17-9i$

10) $(-5+7i)(6-8i)$ → $-30+40i+42i-56i^2$ $+56$

= $26+82i$

11) $(-8i)(5i)(-2+8i)$ → $40(-2+8i)$

$-40i^2=40$ $-80+320i$

12) $(-4-i)(-7-5i)$ → $28+20i+7i+5i^2$ -5

= $23+27i$

13) $(-3-4i)(-4-7i)$ → $12+21i+16i+28i^2$ -28

= $-16+37i$

14) $-5(5i)(-8-8i)$ → $-25i(-8-8i)$

$-25i$ $200i+200i^2$ -200

= $-200+200i$

Find the absolute value of each complex number.

15) $|-3i|$ → $|0-3i|$

$=\sqrt{0^2+(-3)^2}=\sqrt{9}=3$

16) $|10-10i|$

$=\sqrt{10^2+(-10)^2}=\sqrt{200}$ → $\sqrt{100\cdot 2}$

$=10\sqrt{2}$

17) $|6-4i|$

$=\sqrt{6^2+(-4)^2}=\sqrt{52}$ → $\sqrt{4\cdot 13}$

$=2\sqrt{13}$

18) $|2i|$ → $|0+2i|$

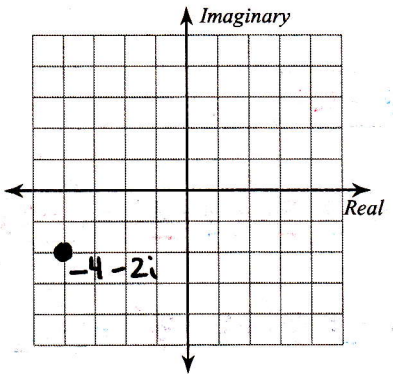
$=\sqrt{0^2+(2)^2}=\sqrt{4}=2$

19) $|3-4i|$

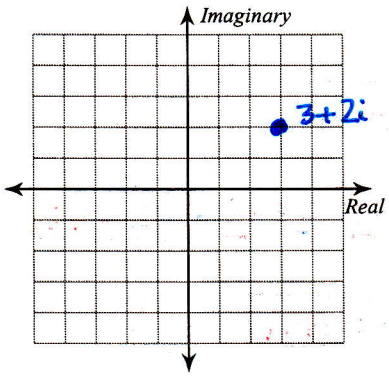
$=\sqrt{3^2+(-4)^2}=\sqrt{25}=5$

Graph each number in the complex plane.

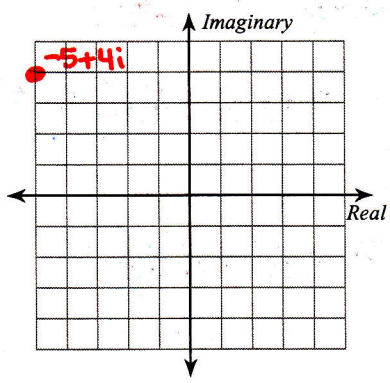
20) $-4 - 2i$



21) $3 + 2i$



22) $-5 + 4i$



Simplify.

23) $\frac{7+5i}{-5-7i} \cdot \frac{-5+7i}{-5+7i} = \frac{-35+49i-25i+35i^2}{25-35i+35i-49i^2} = \frac{-35+49i-25i-35}{25+49} = \frac{-70+24i}{74} = \boxed{\frac{-35}{37}+\frac{12}{37}i}$

24) $\frac{4+8i}{-2-i} \cdot \frac{-2+i}{-2+i} = \frac{-8+4i-16i+8i^2}{4-2i+2i-i^2} = \frac{-8-12i-8}{4+1} = \frac{-16-12i}{5} = \boxed{\frac{-16}{5}-\frac{12}{5}i}$

25) $\frac{-9+6i}{-3i} \cdot \frac{3i}{3i} = \frac{-27i+18i^2}{-9i^2} = \frac{-27i-18}{9} = \boxed{-2-3i}$

26) $\frac{-10-8i}{4+i} \cdot \frac{4-i}{4-i} = \frac{-40+10i-32i+8i^2}{16-4i+4i-i^2} = \frac{-40-22i-8}{16+1} = \frac{-48-22i}{17} = \boxed{\frac{-48}{17}-\frac{22}{17}i}$

27) $\frac{9-9i}{3+9i} \cdot \frac{3-9i}{3-9i} = \frac{27-81i-27i+81i^2}{9-27i+27i-81i^2} = \frac{27-108i-81}{9+81} = \frac{-54-108i}{90} = \boxed{\frac{-3}{5}-\frac{6}{5}i}$

28) $\frac{2+8i}{4i} \cdot \frac{-4i}{-4i} = \frac{-8i-32i^2}{-16i^2} = \frac{-8i+32}{16} = \boxed{2-\frac{1}{2}i}$

Name _____ Date _____ Class _____

Express each number in terms of *i*.

1. $\sqrt{-32}$ → $\sqrt{-16 \cdot 2}$ → $4i\sqrt{2}$

2. $2\sqrt{-18}$ → $2\sqrt{-9 \cdot 2}$ → $6i\sqrt{2}$

3. $\sqrt{-\frac{1}{9}}$ → $\frac{\sqrt{-1}}{\sqrt{9}}$ → $i/3$

Solve each equation.

4. $3x^2 + 81 = 0$ → $3x^2 = -81$ → $x^2 = -27$ → $x = \pm\sqrt{-27}$ → $x = \pm\sqrt{9 \cdot 3}$ → $x = \pm 3\sqrt{3}$

5. $4x^2 = -28$ → $x^2 = -7$ → $x = \pm\sqrt{-7}$ → $x = \pm i\sqrt{7}$

6. $\frac{1}{4}x^2 + 12 = 0$ → $\frac{1}{4}x^2 = -12$ → $x^2 = -48$ → $x = \pm\sqrt{-48}$ → $x = \pm\sqrt{-16 \cdot 3}$ → $x = \pm 4i\sqrt{3}$

7. $6x^2 = -126$ → $x^2 = -21$ → $x = \pm\sqrt{-21}$ → $x = \pm i\sqrt{21}$

Find the values of *x* and *y* that make each equation true.

8. $2x - 20i = 8 - (4y)i$

$2x = 8$ $\quad -20 = -4y$

$x = 4$ $\quad y = 5$

9. $5i - 6x = (10y)i + 2$

$5 = 10y$ $\quad -6x = 2$

$y = 1/2$ $\quad x = -1/3$

Find each complex conjugate.

10. $i - 3$ → $-3 + i$

11. $3i - 4$ → $-4 + 3i$

12. $11i$ → $0 + 11i$

$-3 - i$ $\quad -4 - 3i$ $\quad -11i$