Math Secondary III Name_____
9-2 Complex Operations Period_____

**Write each expression as a pure imaginary number.**

1. $\sqrt{-25}$
2. $\sqrt{-81}$
3. $\sqrt{-13}$
4. $\sqrt{-45}$

**Identify the real and imaginary parts of each complex number.**

5. $4+5i$
6. $-3+2i$
7. $6-3i$
8. $13i$

**Write each expression as a complex number in standard form (a+bi).**

9. $5+\sqrt{-49}$
10. $-2-\sqrt{-28}$
11. $\dfrac{10-\sqrt{-25}}{5}$
12. $\dfrac{4-\sqrt{-8}}{12}$

**Add or subtract as indicated. Write answers in standard form.**

13. $(4+5i)+(2-7i)$
14. $(4+i)-(8-5i)$
15. $\left(-4+\sqrt{-25}\right)+\left(1-\sqrt{-16}\right)$
16. $\left(4-\sqrt{-4}\right)-\left(2+\sqrt{-9}\right)$
17. $\left(-2+\sqrt{-18}\right)+\left(5-\sqrt{-50}\right)$
18. $\left(-10+\sqrt{-20}\right)+\left(-6+\sqrt{-45}\right)$

**Multiply. Write answers in standard form.**

19. $6i(2-4i)$

20. $\frac{1}{3}i(12-15i)$

21. $(2+i)(4+3i)$

22. $(5-2i)(-1+2i)$

23. $(3+2i)^2$

24. $\left(2+\sqrt{-81}\right)\left(-3-\sqrt{-100}\right)$

Write the complex conjugate of the following complex numbers:

25. $3+2i$

26. $7-12i$

27. $-8i$

28. $15i$

Simplify

29. $-\frac{2}{3i}$

30. $\frac{10+6i}{5-3i}$

31. $\frac{12-10i}{3+5i}$

Review

1. State the zeros, multiplicity, and end behavior of $h(x)=(x+3)^2(x-2)$

2. Sketch a graph of the following polynomial $g(x)=-x(x-3)^2(x+4)$