

**Precalculus**  
**Complex Zeros**

**Name** \_\_\_\_\_  
**Date** \_\_\_\_\_

*Write each expression in the standard form  $a + bi$ .*

1.  $(2 - 3i) + (6 + 8i)$

2.  $(4 + 5i) + (-8 + 2i)$

3.  $3(2 - 6i)$

4.  $2i(2 - 3i)$

5.  $(3 - 4i)(2 + i)$

6.  $(5 + 3i)(2 - 3i)$

7.  $(5 + 7i)(5 - 7i)$

8.  $(x - 2 + 5i)(x - 2 - 5i)$

9.  $\frac{1 + 4i}{5 - 12i}$

10.  $\frac{2 - 3i}{5 + 2i}$

Use the given information and your knowledge of complex roots to find the polynomial  $f(x)$  whose coefficient are real numbers. Show all work.

11. Degree 3; zeroes 3,  $4 - i$

12. Degree 4; zeroes 1, 2,  $2 + i$

*Find all the zeros both real and complex of the polynomial. Show all work including division if necessary. Write the polynomial in factored form.*

13.  $f(x) = x^3 - 1$

14.  $f(x) = x^3 - 8x^2 + 25x - 26$

15.  $f(x) = 4x^3 - 9x^2 + 5$

16.  $g(x) = x^3 + x^2 + x + 1$

17.  $h(x) = 2x^4 - 3x^3 + 5x^2 + 11x - 15$

18.  $f(x) = x^4 + 5x^2 + 4$

19.  $j(x) = 3x^4 - x^3 - 9x^2 + 159x - 52$