Discriminant (Assignment 18)

Use the discriminant to determine the number of complex roots and the number of real roots each quadratic function has.

1. $f(x) = 2x^2 - x + 3$

2. $f(x) = x^2 + 3x - 1$

3. $f(x) = x^2 + 6x + 9$

4. $f(x) = -x^2 + 4x - 6$

5. $f(x) = x^2 - 2x + 1$

6. $f(x) = -5x^2 + 2x - 1$

Find polynomials with real coefficients that have the following roots.

7. $x = -2i$

8. $x = 3 + i$

9. $x = 2$ and $x = i$

10. $x = -3i$ and $x = 2i$

Find all roots, including complex roots, of the following functions.

11. $f(x) = 2x^2 + 6$

12. $f(x) = x^2 + 3x + 1$

13. $f(x) = x^3 + 4x^2 + x + 4$

14. $f(x) = -x^2 + x + 6$

15. $f(x) = x^3 + 4x$

16. $f(x) = x^4 - 1$

17. $f(x) = 2x^3$

18. $f(x) = -x^2 + x - 1$