1. Find the x-intercepts for the graph of \( f(x) = x^2 - 6x + 2 \).

2. Graph \( f(x) = 3 - (x + 2)^2 \).

3. Find the vertex of the parabola described by \( y = -7x^2 + 14x + 3 \).

4. Find the domain of the function \( f(x) = \frac{x^2 - 1}{x^2 + 3x - 4} \).

5. Find the quotient and remainder of \( \frac{x^3 - 2x^2 - 5x + 6}{x + 2} \).

6. Graph the polynomial function \( P(x) = x^5 - 4x^3 \).

7. Find all the zeros of \( f(x) = 2x^3 - 2x^2 - 8x + 8 \) given that 2 is one of the zeros.

8. Find the quotient: \( \frac{-6x^3 + x^2 + 17x + 3}{2x + 3} \).

9. Find the value \( P(-2) \) of the polynomial \( P(x) = x^4 + 5x^3 - 7x^2 + 9x + 17 \) using the Remainder Theorem.

10. Find all rational roots of the equation \( x^3 - 5x^2 - 4x + 20 = 0 \) and then find the irrational roots, if any.

11. Find the zeros of the polynomial function \( f(x) = x^4 + x^3 - 15x^2 \).

12. For \( P(x) = 2x^{18} - 5x^{13} + 6x^3 - 5x + 9 \), list all possible rational zeros given by the Rational Zeros Test, but do not check to see which values are actually zeros.

13. Describe the end behavior of \( f(x) = (x + 3)^3 (x - 5)^2 \).

14. Find the zeros and the multiplicity of each zero for \( f(x) = (x^2 - 4)(x + 2)^3 \).

15. Determine how many positive and how many negative real zeros the polynomial function \( P(x) = 3x^6 + 2x^3 - 7x^2 + 8x \) can have.
16. Find the horizontal and the vertical asymptotes of the graph of \( f(x) = \frac{2x^2 + 3}{x^2 - x - 20}. \)

17. Write an equation that expresses the statement, “\( y \) is directly proportional to \( x \) and inversely proportional to the square of \( t \).”

18. In Problem 17, suppose \( y = 6 \) when \( x = 8 \) and \( t = 2 \). Find \( y \) if \( x = 12 \) and \( t = 3 \).

19. The cost, \( C \), of producing \( x \) thousand units of a product is given by

\[
C = x^2 - 30x + 335 \text{ (dollars)}.
\]

Find the value of \( x \) for which the cost is minimum.

20. From a rectangular \( 8 \times 17 \) piece of cardboard, four congruent squares of side length \( x \) are cut out, one at each corner. The sides can then be folded to form a box. Find the volume, \( V \), of the box as a function for \( x \).

21. Write \((2 + 3i)(3 - 2i)\) in the form \( a + bi \).

22. Write \(\frac{3 + 5i}{1 - 3i}\) in the form \( a + bi \).