4.1 Transformations of Cubic Functions Practice

For #1-9: List the transformations, make a table of critical points, and sketch the graph.

1. \( f(x) = x^3 - 3 \)
2. \( f(x) = -2x^3 + 3 \)
3. \( f(x) = (x-5)^3 - 2 \)
4. \( f(x) = \frac{1}{3}(x+5)^3 \)
5. \( f(x) = -3(x+4)^3 + 3 \)
6. \( f(x) = -\frac{1}{2}(x+1)^3 - 2 \)
7. \( f(x) = 0.25x^3 \)
8. \( f(x) = -x^3 + 4 \)
9. \( f(x) = 2(x+1)^3 - 3 \)
For #10-15: Answer each question.

10. The graph of $f(x) = x^3$ has been transformed so that its critical point is (4, -1). What is the equation?

11. The graph of $f(x) = x^3$ has been transformed so that its critical point is still (0, 0), but it now goes through the point (1, 5). What is the new equation?

12. The graph of $f(x) = x^3$ has been shifted left 4.4 units, down 0.5 units, and is upside-down. What is the new equation?

13. The graph of $f(x) = x^3$ has been transformed so that its critical point is (4, 0), and goes through (3, 2) & (5, -2). What is the new equation?

14. The graph of $f(x) = x^3$ has been transformed so that its critical point is on the y-axis and it goes through the points (-1, 2) and (1, 4). What is the new equation?

15. If the critical point of a cubic function is (1, 1) can the graph go through the points (0, 0) and (2, 3)? If so what is the equation? If not, explain why.