1. Determine if the following are polynomials. For each polynomial, state the degree.

   a. $3x^3 + 2x^2 + x + 1 = y$ _____

   b. $\sqrt{3x-2}+1$ _____

   c. $\dfrac{x^3+1}{x}$ _____

2. The root of the function is the same as the _____ of the function.

3. Given roots at -5 and 7, find the factored form equation and general form equation if the curve passes through (6, -22)

4. Given $y = -4(x-1)^2 + 3$

   Find the vertex:
   The exact *x-intercepts*, simplified. (this is difficult)
   General Form:

5. If you are given a parabola with a vertex at (-2, 10), find the equation in vertex form and general form if the curve passes through (6, 26).

6. If a parabola has an x-intercept at (3, 0) and (-4, 0), find the equation in factored form and general form. Assume the scale factor is 4.

can we find vertex form??

7. Find the vertex if the focus is located at (-1, 6) and directrix is $y = -3$.

8. If the vertex is (-2, 10), and the focus is (-2, -14), what is the equation of the directrix?

9. If the directrix is $y = 12$, and the vertex is (3, 7), where is the focus?

10. Write the equation of the parabola with focus (-1,3) and directrix $y = -5$

11. Find all important information for the conic section with an equation: $y = 5(x+3)^2 - 2$

12. A parabola has a directrix at *y* = 18 and a focus at (-16, 12).
    What is the equation of the parabola?

13. A satellite dish's length is 20 inches and its depth is 10 inches. The dish is located 32 inches from the window and 54 inches from the side of the house. Where should the satellite's antenna be placed in order to receive the best transmission?