Junior PreCalc | Name ______________________________
Test Review | Date ___________________ Period: _____

Write an equation for the quadratic function whose graph contains the given characteristics.

1. has a y-intercept of 4 and the point $(2, 0)$ is the vertex

2. has x-intercepts at $(-4, 0)$ and $(0, 0)$ and the point (-2,4) is the vertex

3. passes through the point $(1, 2)$ and the point $(3, 4)$ is the vertex

4. passes through the points $(1, 0)$, $(4, 3)$, and $(5, 8)$

5. passes through the points $(-2, 7)$, $(0, 1)$, and $(8, 17)$

6. Among all the rectangles whose perimeters are 100 feet, find the dimensions of the one with maximum area.

7. A farmer wants to put a fence around a rectangular garden. Only 3 sides must be fenced, since a rock wall will form the fourth side. If he uses 60m of fencing, what is the maximum area possible?

8. Find two positive real numbers whose product is a maximum. The sum of the first and three times the second is 30.

9. A manufacturer of lighting fixtures has daily production costs of $C = 800 - 10x + 0.20x^2$, where C is the total cost (in dollars) and x is the number of units produced. How many fixtures should be produced each day to yield a minimum cost?

Find all the zeros of the function.

10. $f(x) = x^3 - 2x^2 + 20x - 40$

11. $f(x) = 6x^3 + x^2 - 4x + 1$

12. $f(x) = x^3 - x^2 - 8x + 8$

13. $f(x) = x^4 + x^3 - 16x^2 + 4x - 80$

14. $f(x) = x^4 + x^3 - 13x^2 - 7x + 30$

Write a least degree polynomial given the zeros (roots) of the function.

15. $x = -2, -\frac{1}{3}, -\frac{1}{5}$

16. $x = 4, \pm\sqrt{3}$

17. $x = 4, -5, 2i$

18. Use function composition to prove algebraically that $f(x)$ and $g(x)$ are inverses of one another.

$f(x) = 7x + 4$

$g(x) = \frac{1}{7}x - \frac{4}{7}$