**Find the standard equation of any parabola that has vertex V.**

1. V(-3,1)

2. V(0,-3)

**Express f(x) in the form a(x-h)2 + k**

3. f(x) = -x2 - 4x - 8 4. f(x) = 2x2 - 12x + 22 5. f(x) = -3x2 - 6x - 5

6. f(x) = -4x2 + 16x - 13 7. f(x) = 5x2 + 20x + 17 8. f(x) = -3/4x2 + 9x - 34

**Graph to find the zeros of f. Find the minimum or maximum value of f(x).**

13. f(x) = x2 - 4x 14. f(x) = -12x2 + 11x + 15 15. f(x) = 9x2 + 24x + 16

  

16. f(x) = x2 + 4x + 9 17. f(x) = -2x2 + 20x - 43

 

18. Find the standard equation of the parabola with V(4, -1) and through the point (0, 1)

19. Find the standard equation of the parabola with V(-2,4) and through the point (-5,0).

20. Find the standard equation of the parabola with V(3,5) and x-intercept 0.

21. Find the standard equation of the parabola with x-intercepts -3 and 5, highest point has y-coordinate 4.

22. An object is projected vertically upward from the top of a building with an initial velocity of 144 ft/sec. Its distance s(t) in feet above the ground after t seconds is given by the equation s(t) = -16t2 + 144t + 100.

(a) Find its maximum distance above the ground.

(b) Find the height of the building.