Week 9 Questions and Answer Key

- Day 1, Parabolas 8-12
- Day 2, 13-17
- Day 3, 18-21
- Day 4, Review
- Day 5, Circles and Parabolas Test

Find the Focus and the Directrix for the following Parabolas:

8. $x^2 = 4y$
   Focus =(0,1) & Directrix y=-1

9. $y^2 = -16x$
   Focus =(-4,0) & Directrix x=4

10. $y^2 = x$
    Focus =($\frac{1}{4}$,0) & Directrix x=$\frac{-1}{4}$

11. $x^2 = 16y$
    Focus =(0,4) & Directrix y=-4

12. $y^2 = 8x$
    Focus =(2,0) & Directrix x=-2

Given the focus and directrix for the following, find the equation for the parabola.

13. (2,0), x=-2
    $y^2 = 8x$

14. (-8,0), x=8
    $y^2 = -32x$

15. (0,6), y=-6

    $x^2 = 24y$

16. (-1,3), x=3

    $y^2 - 6y + 8x + 1 = 0$ or $(y-3)^2 = -8(x-1)$

17. (2,-5), y=-1

    $x^2 - 4x + 8y + 28 = 0$ or $(x-2)^2 = -8(y+3)$

Given the focus and the vertex, find the equation for the parabola.

18. *focus*=(-4,0), *vertex*=(0,0)

    $y^2 = -16x$

19. The shape of a wire hanging between two poles closely approximates a parabola. Find the equation of a wire that is suspended between two poles 40m apart and whose lowest point is 10 m below the level of the insulators.

    $y^2 = 40y$

20. A suspension bridge is supported by two cables that hang between two supports. The curve of these cables is approximately parabolic. Find the equation of this curve if the focus lies 8m above the lowest point of the cable.

    $y^2 = 32y$

21. A culvert is shaped like a parabola, 120cm across the top and 80cm deep. How wide is the culvert 50cm from the top?

    width at -50cm =73.485cm