Math 20 -2

Quadratic Functions Worksheet

**Part A: Given the following equations, list the transformations that will occur:**

|  |  |
| --- | --- |
| Y = (x – 1)2 + 3 |  |
| Y = (x + 4)2 – 5 |  |
| Y = 2(x – 3)2 – 2 |  |
| Y = -3(x + 1)2 |  |
| Y = ½(x)2 + 5 |  |

**Part B: From the following quadratic Graphs, determine the equation of the quadratic function in the form y = a(x – h)2 + k.**

**Part C: Determine the necessary information in the following problem solving applications.**

1. An arch is in the form of a parabola with the vertex at the top of the arch. The curve can be modeled by the function: h = -0.06d2 + 120, where h is the height of the arch in meters, and d is the horizontal distance across the arch in meters.
2. Draw a sketch of the arch below. Indicate your window settings as well.
3. Determine the maximum height of the arch.
4. Determine the width of the arch at its base to the nearest tenth of a meter.
5. A football is punted so that its path is given by the equation:

H = -4.9(t – 2.2)2 + 25,

Where H is the height of the football in meters, and t is the time in seconds since the ball was kicked.

1. Sketch the path of the football. Indicate your window settings.
2. What is the maximum height of the football? How many seconds after it was kicked does the football reach this height?
3. How high was the football above the ground when it left the punter’s foot? (ie. Find the initial height of the football). Give your answer to the nearest tenth of a meter.
4. How long was the football in the air for? How far down the field (in meters) did the football hit the ground?

**Part D: Determine the equation of the following quadratic equations in the form y = a(x – h)2 + k.**

1. The vertex of the quadratic is at (2, -5) and it passes through the point (-1, 13).
2. The quadratic has x – intercepts at (2, 0) and at (8, 0) and has a maximum value of 6.

 (HINT: The vertex must be halfway between the x – intercepts and at the maximum value)