## MATH 1151 – Precalculus Supplemental Lab Parabolas, Circles, & Exponents

The quality of pizza varies on many factors, one of which is time spent cooking in the oven. The relationship between quality and time can be described by the equation  $Q(t) = \frac{-4}{9}t^2 + \frac{120}{9}t$ , where t represents time in minutes.

1. Rewrite the equation in vertex form:  $y = a(x - h)^2 + k$ 

2. Determine:
a. vertex
b. x-intercepts
c. y-intercept
d. line of symmetry
e. concavity
f. domain/range

- 3. Graph the function. Label your axes.

Quality Control Questions

- 4. When is the pizza at its highest quality value? When is the pizza at its lowest quality value?
- 5. If a company can only sell a pizza when the quality is above 75%, what are the cooking times they must maintain? Be exact and show your work.

- 6. When is there a negative rate of quality over time?
- 7. What is happening to the pizza at t > 25?

For questions 9 and 10, use the equation  $Q(t) = \frac{-4}{9}t^2 + \frac{120}{9}t + 5$ 

- 8. With the new equation, what changed graphically?
- 9. Define in your own words what Q(0) means.