Read each problem **very carefully** before starting to solve it. Each problem is worth around 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. [4 points] In 2014 a school population was 900 students. By 2021, the school population had increased to 1,124 students.

    (a) Let t be the number of years since 2014. Write an equation for the population $P(t)$ of the school as a function of t assuming linear growth.

    (b) According to your model, during which academic year is the population predicted to surpass the 1,500 mark?

2. [4 points] Your dad is looking to buy a used car. A Model A costs $12,000 and devaluates at the rate of $350 per year, whereas a Model B costs $15,000, but devaluates at the rate of $500 per year.

    (a) Write equations for the values $V_A(t)$ and $V_B(t)$ of the two cars t years from now.

    $V_A(t) =$

    $V_B(t) =$

    (b) For how long would your dad have to keep his car before selling it so that Model A would be a better buying option for him at present?
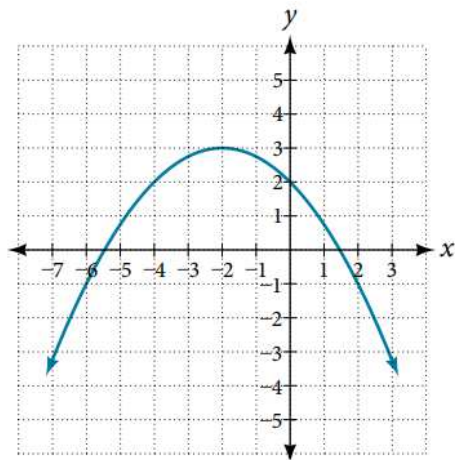
3. [6 points] Answer the following questions dealing with quadratic equations and parabolas.

(a) Consider $f(x) = -2x^2 + 8x - 6$.

   (i) Find the location of the vertex.

   (ii) Find the x-intercept(s).

(b) Let $y = g(x)$ be given by the following graph.

   (i) Write an equation for $g(x)$ in the standard form.

   (ii) Convert the equation you found in (b), Part (i), to general form.