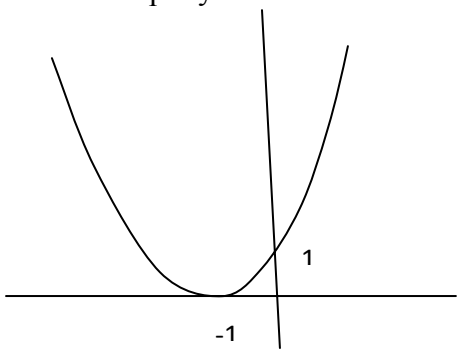
ECO137 Quiz1 Oct.31.2008

1. Find domain of $y = (5-x)^{1/2}$
   $5-x \geq 0 \Rightarrow x \leq 5$: Domain $(-\infty \ 5]$
2. Determine the linear function passing the two points (-1, -3) and (2, -5)
   $y- (-3) = (-5 – (-3)) / (2- (-1)) \ *(x – (-1))$
   $y + 3 = -2/3* (x+1)$
   $y = -2/3*x – 11/3$
3. Find the possible function for the graph (x-intersects are -1 and 3, and passing through a point (1, -2)
   $y = A(x+1)(x-3)$
   $-2 = A*2*(-2)$
   $A = ½$
   $y = f(x) = 1/2 (x+1)(x-3) = 1/2x^2 – x – 3/2$
4. Initial deposit of $100 earn 12% interest per year. What is the doubling time?
   $100*(1.12)^t = 200$
   $(1.12)^t = 2$
   $tln(1.12) = ln2$
   $t = ln2/ln(1.12) = 6.116$
5. Sketch $y = (x+1)^2$



6. For $f(x) = 2x^3 – 2x^2 – 2x$
   a. Derive 1st and 2nd derivatives
      $f'(x) = 6x^2 – 4x -2$
      $f''(x) = 12x - 4$
   b. Find the interval f is decreasing
      $f'(x) = 6x^2 – 4x -2 = 0 \Rightarrow x = 1, -1/3$
      f is decreasing in x: $[-1/3 \ \ 1]$
   c. Find the minimum and maximum values of f(x) within the interval of x $[-1/2 \ \ 3/2]$
      $f(1) = -2$ (min)
      $f(-1/3) = 0.37$ (max)
   d. Explain the result of c by using the outcome of 2nd derivative
      $f''(1) = 8 > 0$ (minimum)
      $f''(-1/3) = -8 < 0$ (maximum)
7. Find inverse demand function given $D = 32/5 – 3/10 P$
   $P = -10/3 D + 64/3$
8. $F(x) = x^3 + 3x^2 + 3x + 1$
   a. List all possible roots by using rational root theorem
      $+ 1, - 1$
   b. Conduct polynomial division. Use a root which result in no remainder
      $(x^3 + 3x^2 + 3x + 1)/(x+1) = x^2 + 2x + 1$
      $(x^2 + 2x + 1)/(x+1) = x+1$
   c. By using the result in b, rewrite f(x).
      $f(x) = (x+1)^3$