Quadratics Review Questions

1. Given the demand function, $p(x) = -2x + 20$ and the cost function, $C(x) = 2x + 16$, in thousands of dollars, determine:
   a. The revenue function, $R(x)$. *Remember, $R(x) = [p(x)](x)$*
   b. The maximum revenue, **by completing the square**.
   c. The number of units that need to be sold to achieve the maximum revenue.
   d. The profit function, $P(x)$.
   e. The start-up cost.
   f. The break-even points, **by factoring**.
   g. The maximum profit, **using the break-even points**.
   h. The number of units that need to be sold to achieve the maximum profit.
   i. The number of units that need to be sold to reach a profit of $12,000.
   j. The equation of $P^{-1}(x)$.
   k. The domain and range of $P(x)$ and $P^{-1}(x)$.

1. Given $f(x) = -2\sqrt{6}(x + 3\sqrt{3})(x - 5\sqrt{3})$, determine, using exact values,
   a. The zeros of the function.
   b. The coordinates of the vertex.
   c. The value of the y-intercept.
   d. The vertex form equation of the parabola.
   e. The standard form equation of the paraboa.
   f. The value of $f(x)$ when $x = 4$.
   g. The value of $f(x)$ when $x = 4\sqrt{3}$.