Assignment 2

1. Expand and simplify

a) $3m(2m + 9)$

b) $4(x + 2)^2 - (x + 2)(x - 2)$

2. Factor

a) $x^2 + 2x + 1$

b) $x^2 - x - 2$

c) $4m^2 - 28m + 40$

d) $2a^2 + 12a + 16$

3. Factor the expression further.

$(x^2 + 4)(x^2 - 4)$

4. Consider the quadratic function

$$\boldsymbol{f(x) = -2(x-1)^2 - 3}$$

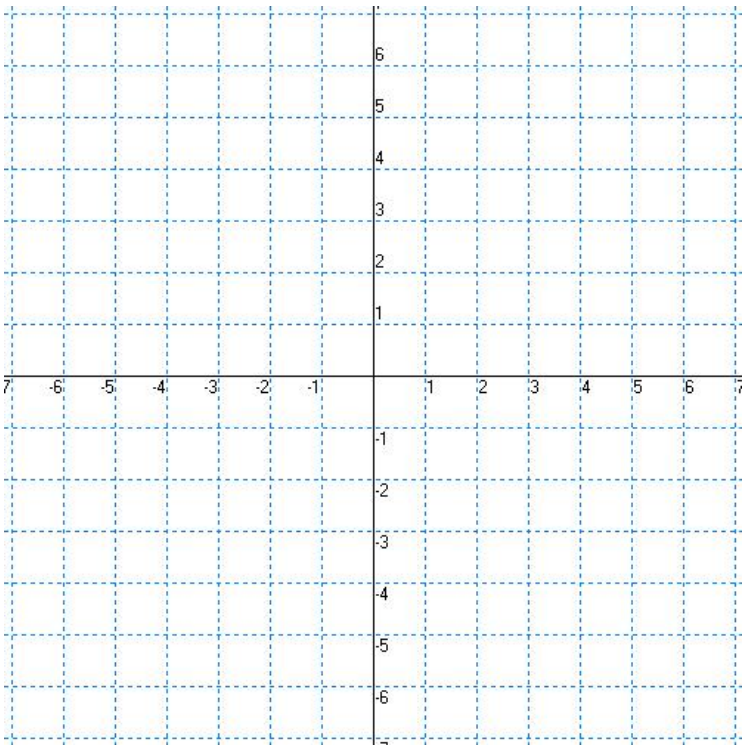
a) In which form is this function? Does this parabola open upward or downward?

b) What are the coordinates of the vertex? Is the vertex a maximum or minimum?

c) What is the axis of symmetry?

d) What is the y-intercept?

e) Graph the function



5) Digital music player cases sell for $20 each. Research by the seller has shown that for each $10 increase in price, 100 fewer cases will be sold. The revenue generated from case sales can be represented by the function

$$\boldsymbol{R(x) = (2 + x)(6 - x)}$$

where $\boldsymbol{R(x)}$ is the revenue, in thousands of dollars, and *x* is the number of $10 price increases.

a) What are the *x*-intercepts of this function?

b) use the x-intercepts to find the coordinates of the vertex.

c) Is the vertex a maximum or a minimum?

d) How many $10 price increases should there be in order to maximize revenue?

e) What is the selling price that gives the maximum revenue?

6) A javelin is thrown from a raised platform. Its height as a function of time is given by the equation:

$$\boldsymbol{h(t) = -5t^2 + 20t + 25}$$

, where $h(t)$ is the height of the javelin, in metres, and t is the time, in seconds.

a) Write the equation in factored form.

b) What is the hang time of the javelin?