8. [12 points] Let

$$V(x) = -\frac{1}{2}x^2 + \frac{9}{2}x + \frac{47}{8} \qquad \text{for} \qquad 0 \le x \le 10$$

be the number of viewers of a 10-minute interview (in millions), x minutes after the interview started.

a. [5 points] Write the quadratic function $V(x)$ in vertex form by completing the square. Show all your work carefully, step by step to receive full credit.

$V(x) =$_____

b. [3 points] In how many minutes after the beginning of the interview did the number of viewers reach its minimum and maximum, respectively?

Minimum after: _____ Maximum after: _____

c. [4 points] For how long will the number of viewers of the interview be more than 10 million? Recall that

$$V(x) = -\frac{1}{2}x^2 + \frac{9}{2}x + \frac{47}{8} \qquad \text{for} \qquad 0 \leq x \leq 10.$$

Solve this problem algebraically. Your answer must be in **exact form**. Show all your work.

Answer: _____