

The Water Tower Problem

A valve on the side of one of the Rockingham County Water towers failed a little over 2 hours ago. A gauge has been reporting the rate of gallons of water lost per minute since the valve failed. The readings are included in the table below. Engineers have been alerted to the failure but only have equipment to repair the valve when the water is flowing less than 475 gallons per minute. Furthermore, their equipment must be calibrated to the rate of the water leaking from the tank in order to repair the valve.

Time Leaking (minutes)	0	39	76	111	144
Flow Rate (gallons per minute)	1000	950	900	850	800

Emily, the head engineer, recalls that the last time her team had to repair this particular water valve, it took 400 minutes to drain to the bottom of the valve.



- At what time can they use their equipment to stop the leak? Confirm your answer using a representation (table, graph, equation, etc.) of your choosing.
- Devise a way for Emily and her engineer's to predict how many minutes the tower has been leaking given the readings from the flow rate gauge. How can you show this using the information from part (a)?