

4. (13 points) Brian's favorite web site is woot.com. This site generally sells one item each day and records the number of sales during each hour of the daily special. On Thursday, Brian noted that the day's graph of sales looked sinusoidal. At 1:00 a.m., there were 70 items sold—and again at 3:00 p.m.. Between those hours, the sales went down (once) to a low of 20 items and then up (once) to a high of 120 items before the last 70 items were sold at 3:00 p.m..

- (a) Determine a trigonometric function that would model sales, S , as a function of t in hours after 1:00 am, assuming that the graph Brian saw was sinusoidal.

$$S(t) = -50 \sin\left(\frac{\pi}{7}t\right) + 70$$

- (b) What is the period of your function?

The period is 14 hours

- (c) What is the amplitude of your function?

The amplitude is 50

- (d) Approximately when were the sales increasing fastest?

The sales are increasing the fastest at seven hours past 1:00 am, or at 8:00 am.