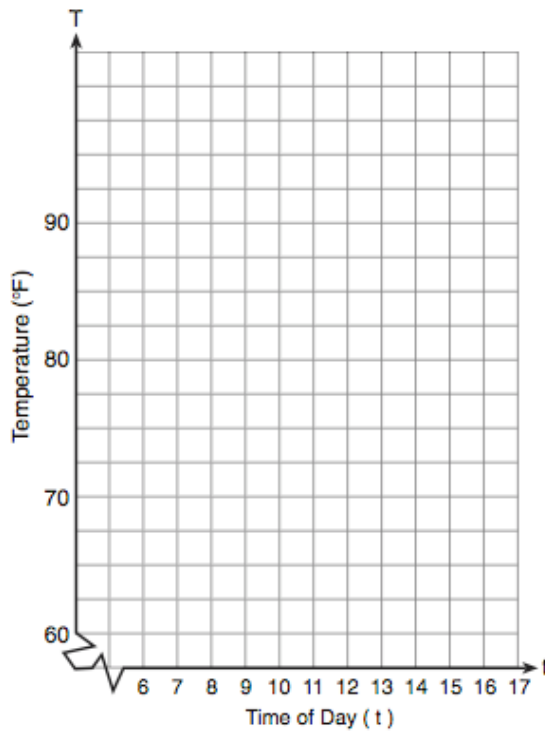
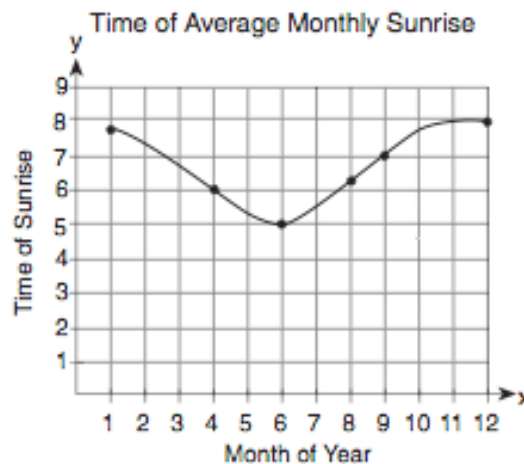


1. A building's temperature,  $T$ , varies with time of day,  $t$ , during the course of 1 day, as follows:  $T = 8 \cos t + 78$ . The air-conditioning operates when  $T \geq 80^\circ F$ . Graph this function for  $6 \leq t < 17$  and determine, to the nearest tenth of an hour, the amount of time in 1 day that the air-conditioning is on in the building.



1.

2. The times of average monthly sunrise, as shown in the accompanying diagram, over the course of a 12-month interval can be modeled by the equation  $y = A \cos(Bx) + D$ . Determine the values of  $A$ ,  $B$ , and  $D$ , and explain how you arrived at your values.



2.

3. A monitor displays the graph  $y = 3 \sin 5x$ . What will be the amplitude after a dilation of 2?

- (1) 5
- (2) 6
- (3) 7
- (4) 10

4. The path traveled by a roller coaster is modeled by the equation  $y = 27 \sin 13x + 30$ . What is the maximum altitude of the roller coast?

- (1) 13
- (2) 57
- (3) 57
- (4) 30

3.

4.