Angular Velocity = $\omega = \frac{2\pi}{T}$ (where T is time for one revolution)

Linear Velocity = $r\omega$

Arc Length = $r\theta$ (where θ is in radians)

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49 Basically the "angle" between the cities is 40.3 – 26.4 degrees. Convert that angle to radians and apply the formula for arc length (where the angle is in radians). My answer is about 961 miles.

51 You are given "inches" and "seconds" are asked for "miles" per "hour".
My answer is about 15 mph.

53 About 11.5 seconds to lift turbine.

55 My answer is for part a is 16π (about 50 m^2)
For part b use: $32\pi = \frac{1}{2}\cdot 12^2\theta$
For part c use : $32\pi = \frac{1}{2}r^2\theta$ where $\theta = \frac{2\pi}{9}$ and solve for *r*.

57 Part c I got 6.67 miles per second

59 I got about 35 mph.

"Frequency" = cycles per unit of time

"Period" = length (of time) of 1 cycle

Frequency and Period are reciprocals.

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23 Part b $-3\sqrt{2} = -4.24$ and is moving away from equilibrium. Draw the sketch of the graph.
Notice that the bottom is at 3 so when t < 3 the weight is moving down and (for part c) after t=3, the weight is moving up toward equilibrium.

25 Use t = 0 as noon. When you solve and get $t \approx -1.57$ look at the graph and see what other values of *t* will also be about 32°.

35 Very much like problem 25