

Applications of Trigonometric Functions

7. A small windmill has its centre 6 m above the ground and blades 2 m long. In a steady wind, a point P at the tip of one blade makes a complete revolution in 12 seconds.
- a) Determine a function that gives the height of P above the ground at any time t . Assume the rotation starts at the highest possible point.

b) When is the blade 7 m above the ground, during the first revolution?

8. In the Bay of Fundy, the water around the harbour changes from 1.5 m at low tide at 02:00 h to 15.5 m at high tide at 08:00 h.
- a) If the tidal cycle is sinusoidal, determine a function to represent the depth of the water in the harbour.
- b) It is safe to enter the harbour when there is at least 3.5 m of water. During what times is it safe to enter the harbour, over a 24-hour period?