b) the range of the function f; *ran f = [0, 36]. The height of the projectile varied between 0 m and 36 m.*

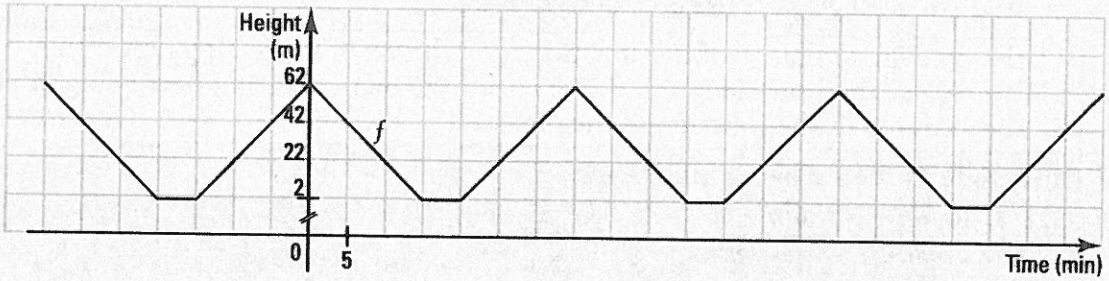
c) the initial value of the function f; *20 m. The height of the projectile, at the beginning (t = 0), is equal to 20 m.*

d) the maximum of the function f; *max f = 36. The maximum height reached by the projectile is 36 m. This maximum height is reached 2 seconds after its launching.*

e) the zero of the function f; *5 s. The projectile enters the water five seconds after its launching.*

f) the variation of the function f. *the function f is increasing in [0, 2] and decreasing in [2, 5]. The projectile moved upwards during the first 2 seconds of the trajectory and then downwards during the next 3 seconds.*

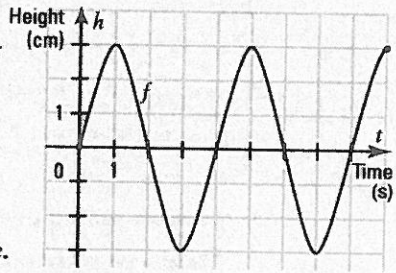
4. A periodic function f associates, to the time t (in minutes), the height h (in meters) of a chair lift.



a) Determine the period P and the frequency F of this function. *P = 35; F = $\frac{1}{35}$*

b) Determine the height of the chair lift after 185 minutes.
It will be at a height of 22 m.

5. The movement of a suspended object with a vertically oscillating spring is modeled by the periodic function f represented on the right.



a) Determine and interpret

1. the period of the function; *P = 4 sec. The duration of the cycle is equal to 4 sec.*

2. the frequency of the function; *$F = \frac{1}{P} = \frac{1}{4}$ = 0.25 cycle. 0.25 cycle per second is observed.*

3. the range of the function; *ran f = [-3 ,3]. The object oscillates 3 cm upwards and downwards from its balancing point.*

b) Describe the variation of the function during the first 4 seconds.

The function is increasing in [0, 1], decreasing in [1, 3], and then increasing again in [3, 4]. The object moves upwards during the first second and downwards between times t = 1 s and t = 3 s and then again upwards between times t = 3 s and t = 4 s.

c) What will be the position of the object at time t = 11 s?
The object will be located at 3 cm below the balancing point.