

Name:

Group 2

Result:

1.*(3 points)*

The temperature T , in $^{\circ}C$, in Warsaw on a summer day t hours after midnight have been recorded and displayed in the table below:

t	0	2	4	6	8	10	12	14	16	18	20	22
T	17.1	15.7	15.6	17.0	19.4	22.2	24.5	26.0	25.9	24.5	22.2	19.5

- a) Use technology to find a *sine* model for the temperature on a Warsaw summer day.
- b) Use your model to estimate the temperature at 9:30 on a summer day in Warsaw.

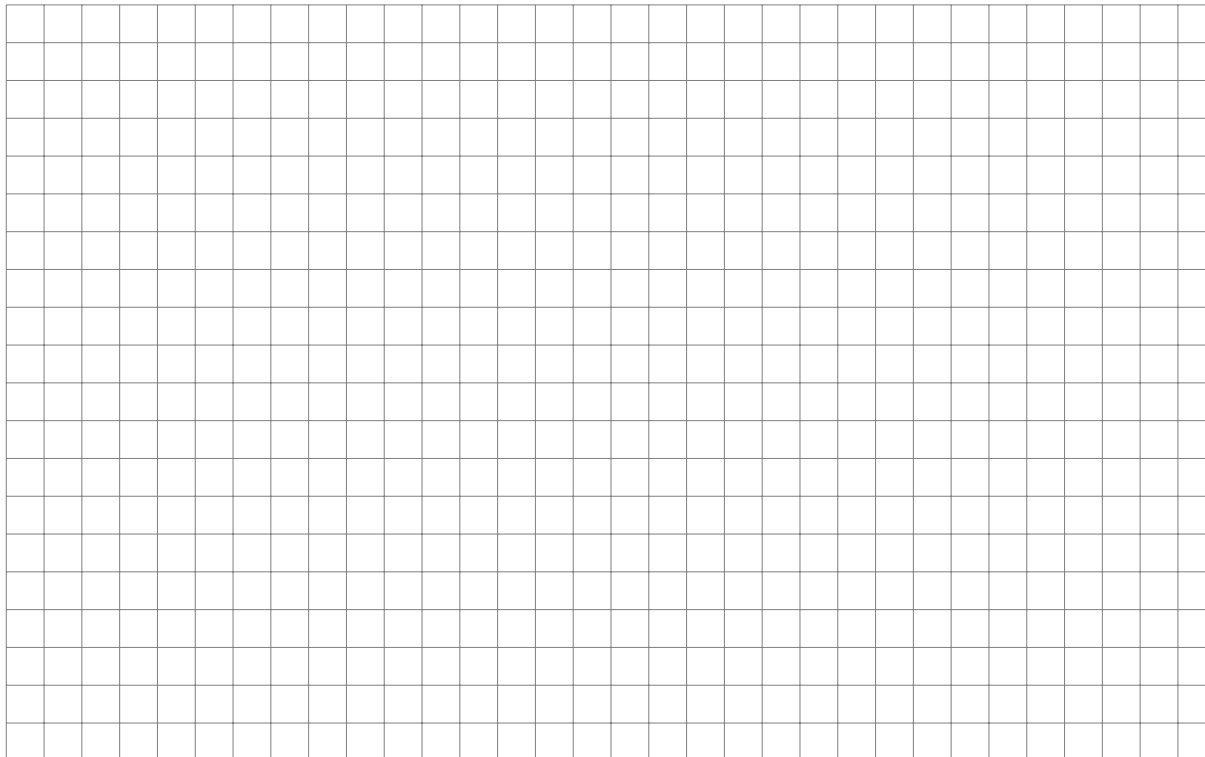
2.*(7 points)*

The temperature in an industrial fridge is given by the equation:

$$T(t) = 3 - 0.5 \sin\left(\frac{\pi}{15}t\right)$$

where T is temperature measured in $^{\circ}\text{C}$ and t is time measured in minutes since the thermostat is turned on.

a) Sketch the graph of T for $0 \leq t \leq 60$.



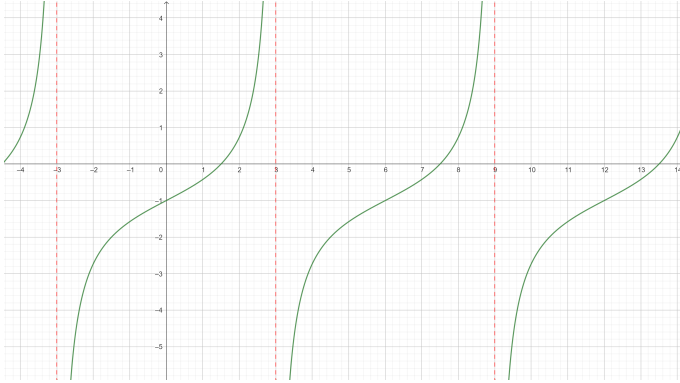
b) State the maximum temperature in the fridge and t at which it occurs for the first time.

c) Find the temperature in the fridge 2 minutes after the thermostat is turned on.

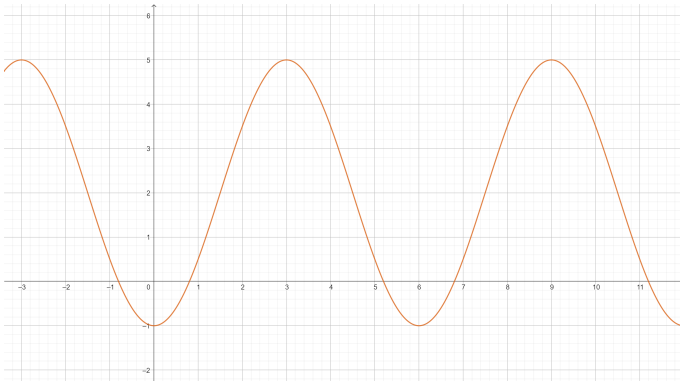
d) Calculate how long during the first 60 minutes will the temperature in the fridge be below 3.1°C .

3.*(6 points)*Find the constants A, B, C and D (where appropriate) given the graphs of the functions:

a) $f(x) = \tan(Bx) + D$



b) $g(x) = A \cos(Bx) + D$



c) $h(x) = A \sin(B(x - C)) + D$

