Name:
Group 1
Result:

1. *(3 points)*

The temperature T, in $°C$, 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	16.1	14.7	14.6	16.0	18.4	21.2	23.5	25.0	24.9	23.5	21.2	18.5

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 7:30 on a summer day in Warsaw.

2. *(7 points)*

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

$$T(t) = 3.5 - 0.5 \sin\left(\frac{\pi}{10}t\right)$$

where T is temperature measured in $°C$ 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.

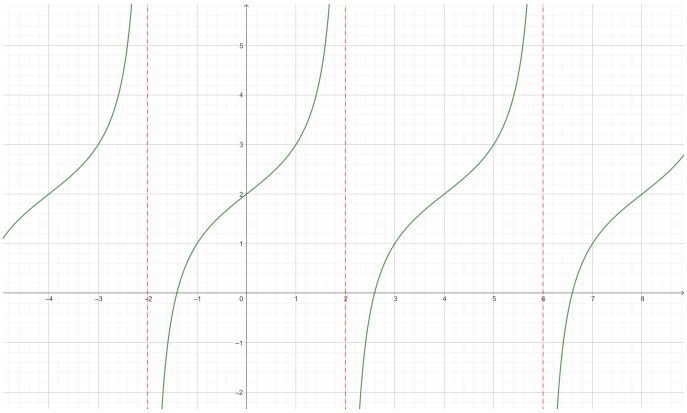
c) Find the temperature in the fridge 2 minutes after the thermostat is turned on.

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



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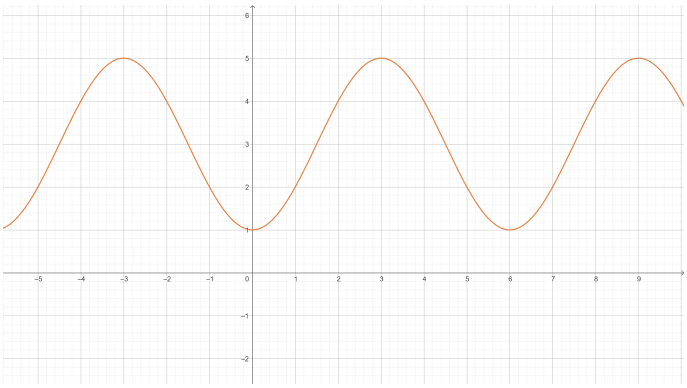
b) $g(x) = A\cos(Bx) + D$



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