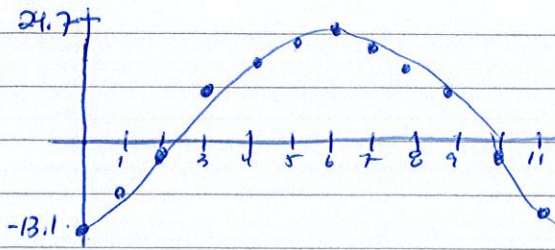


pg 405

11.a)



Jan = 0

* Bad scatterplot!!
(should use graph paper, scale, ruler, etc to be more accurate)

b) periodic since the pattern of temperatures will repeat

c) max 24.7
min -13.1

d) $k = 360 \div 12$
 $k = 30^\circ$

the period of the data is 12 \rightarrow repeats every 12 months

e) $d = \frac{24.7 + (-13.1)}{2}$
 $d = 5.8$

f) $b = 6$ (6 to the right for positive cosine)

$a = \frac{24.7 - (-13.1)}{2}$
 $a = 18.9$

g) $T(t) = 18.9 \cos(30(t-6)) + 5.8$

NOTE other models are possible with different 'b' values.

test (1, -9) $T(1) = 18.9 \cos(30(1-6)) + 5.8$
 $= -10.6$ close

h) $T(38) = 18.9 \cos(30(38-6)) + 5.8$
 $= -3.65^\circ\text{C}$

month 38 would be March (2 yrs later)
March has a temp of -1.1°C from the table \therefore makes sense

i) When would the temp be 10°C ?

$$10 = 18.9 \cos(30(t-6)) + 5.8$$

$$\frac{4.2}{18.9} = \frac{18.9 \cos(30(t-6))}{18.9}$$

$$\cos^{-1} \left| \frac{4.2}{18.9} \right| = 30(t-6)$$

$$77.16 = 30(t-6)$$

positive S | (A)
T | (C)

part way through September the temp should be 10°C .

Q1:
 $77.16 = 30(t-6)$
 $\frac{77.16}{30} + 6 = t$
 $t = 8.57$

Q4:
 $30(t-6) = 360 - 77.16$
 $t = \frac{360 - 77.16}{30} + 6$
 $t = 15.4$ ← this is in the next year. omit