$T_H(n) = 2T_H(n-1)$ is homogeneous part

$r^n = 2r^{n-1}$

$r = 2$ (5 is not a root)

$m_1 = 1$

So $\boxed{T_H = c\,2^n}$

$p(n) = n^2$

Find $p(n)$ Form of $p(n) = n^m p'(n) 5^n = n^0 (c_2 n^2 + c_1 n + c_0) 1^n = c_2 n^2 + c_1 n + c_0$

Find c_2, c_1, c_0 by plugging $p(n)$ into $T(n) = 2T(n-1) + n^2$

$$c_2 n^2 + c_1 n + c_0 = 2\left[c_2 (n-1)^2 + c_1 (n-1) + c_0\right] + n^2$$

from n^2: $c_2 = 2c_2 + 1 \Rightarrow c_2 = -1$

from n: $c_1 = -4c_2 + 2c_1 = 4 + 2c_1 \Rightarrow c_1 = -4$

from 1: etc. find c_0

$p(n) = -n^2 - 4n + c_0$

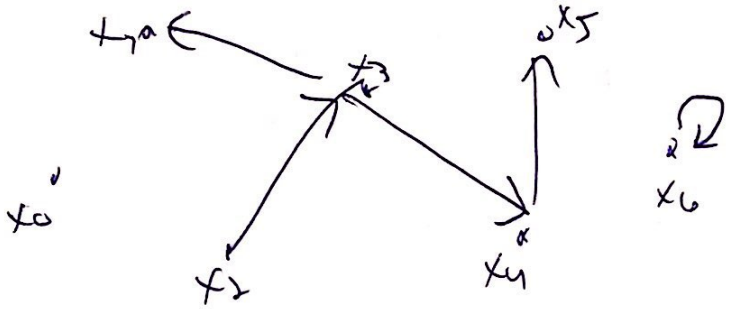
$T(n) = c\,2^n + (-n^2 - 4n + c_0)$

Then use base case to find c_0

Please read relevant textbook sections for relations & functions listed at top of hw6 assignment.

Relations A relation is a set of n-tuples, for arity n. most common & useful case is $n=2$. (binary relation)

- easily drawn as a graph.



$\{(x_3, x_1), (x_2, x_3), (x_3, x_4), (x_4, x_5), (x_4, x_6)\}$

A binary relation $R(x,y)$ can be:

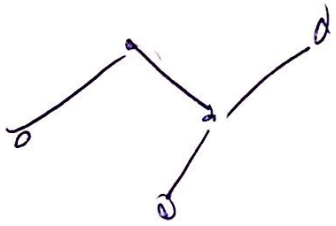
reflexive $\forall x \in D \; R(x,x)$ $\leq$

irreflexive $\forall x \in D \; \neg R(x,x)$ $<$

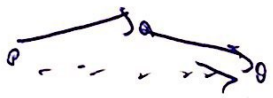
symmetric $\forall x \forall y \; R(x,y) \rightarrow R(y,x)$

anti-symmetric $\forall x \forall y \; R(x,y) \wedge R(y,x) \rightarrow x = y$

"no footballs property"



transitive: $\forall x \forall y \forall z \; R(x,y) \wedge R(y,z) \rightarrow R(x,z)$



A reflexive antisymmetric transitive relation is called a partial ordering.

A reflexive symmetric transitive relation (rst) is called an equivalence relation.