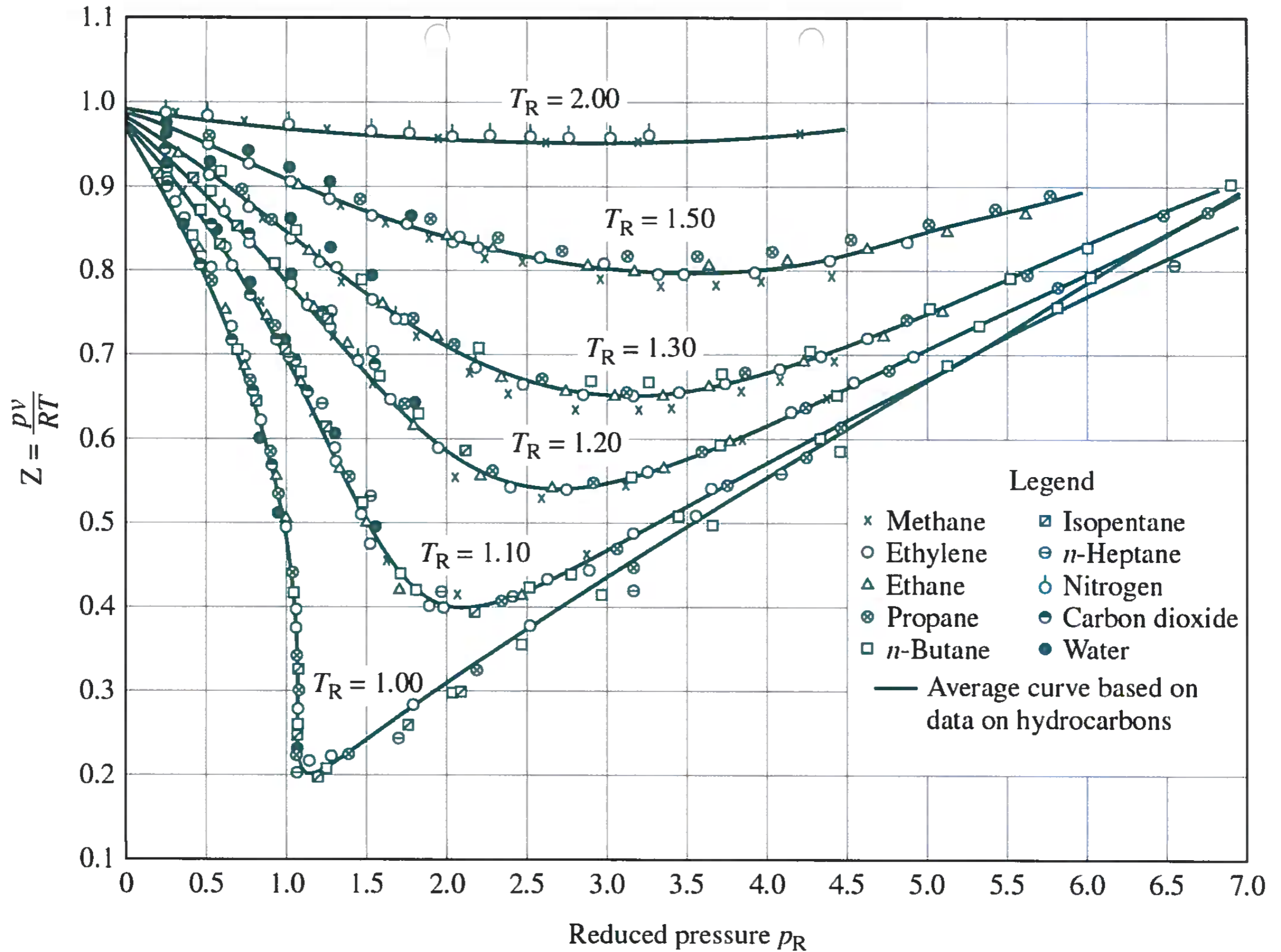


# Law of corresponding states



$H < 0$   
 $T > T_c$

$T = T_c$

$T < T_c$

$H = 0$   
 $T > T_c$

$T = T_c$

$T < T_c$

$H > 0$   
 $T > T_c$

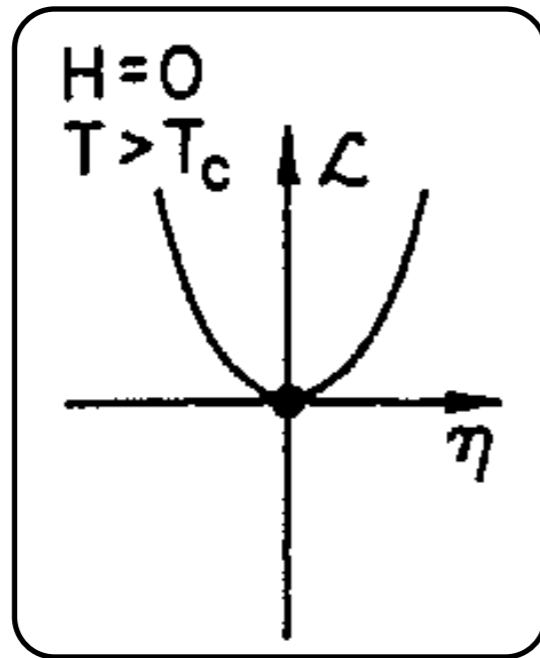
$T = T_c$

$T < T_c$

$H < 0$   
 $T > T_c$

$T = T_c$

$T < T_c$



$T = T_c$

$T < T_c$

$H > 0$   
 $T > T_c$

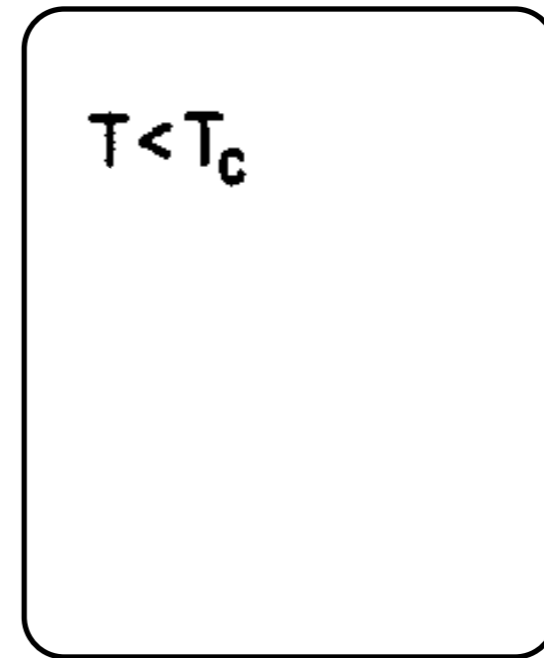
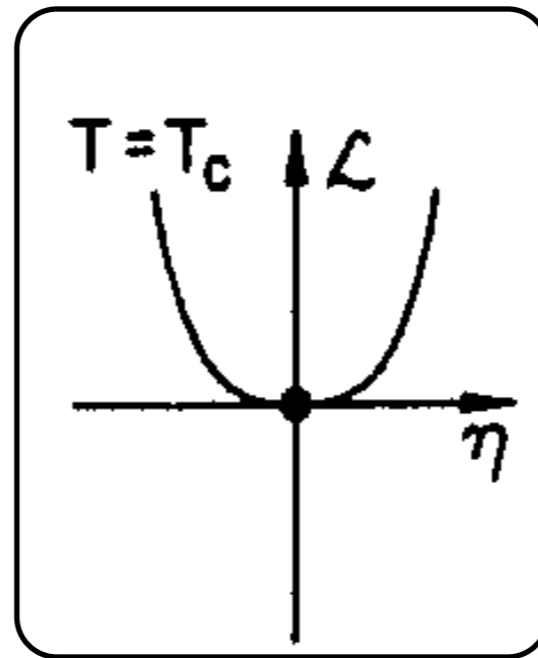
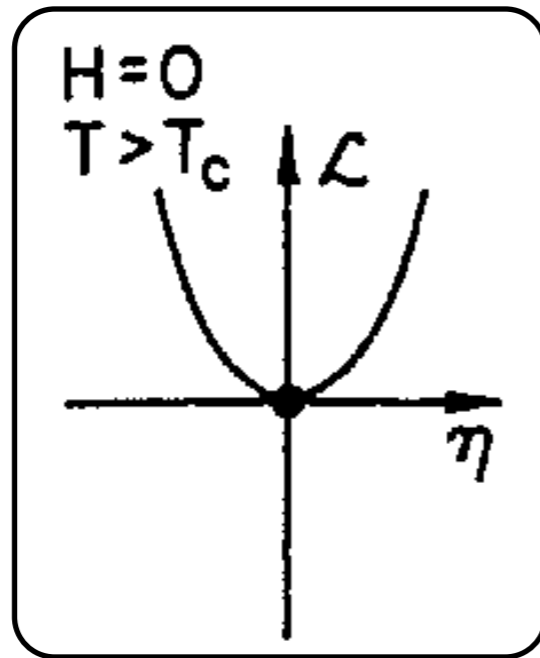
$T = T_c$

$T < T_c$

$H < 0$   
 $T > T_c$

$T = T_c$

$T < T_c$



$H > 0$   
 $T > T_c$

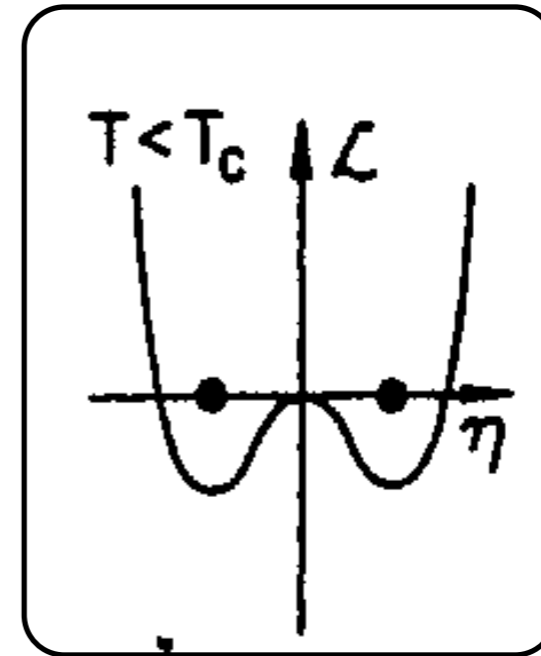
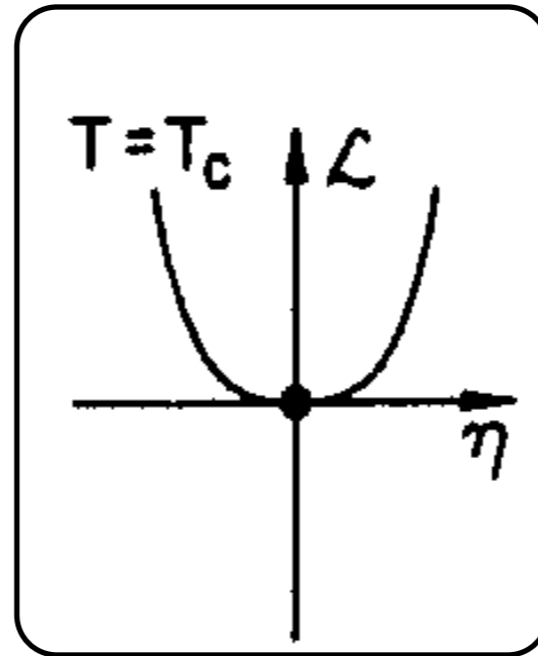
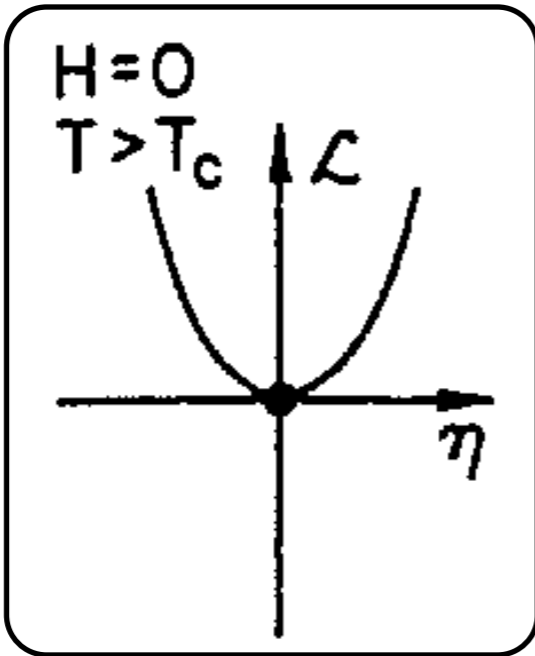
$T = T_c$

$T < T_c$

$H < 0$   
 $T > T_c$

$T = T_c$

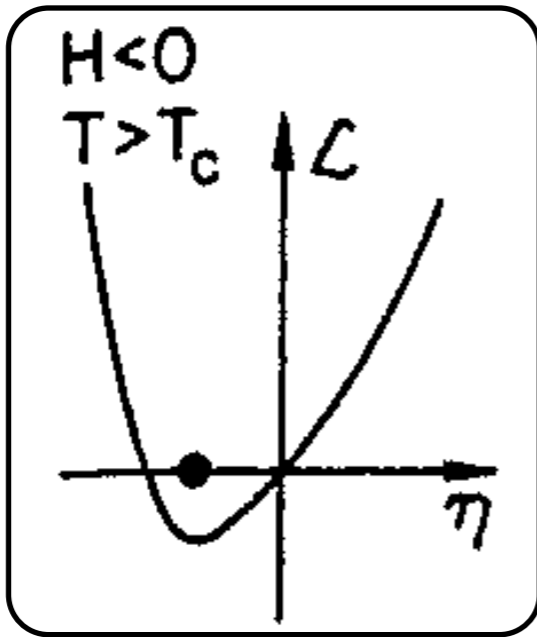
$T < T_c$



$H > 0$   
 $T > T_c$

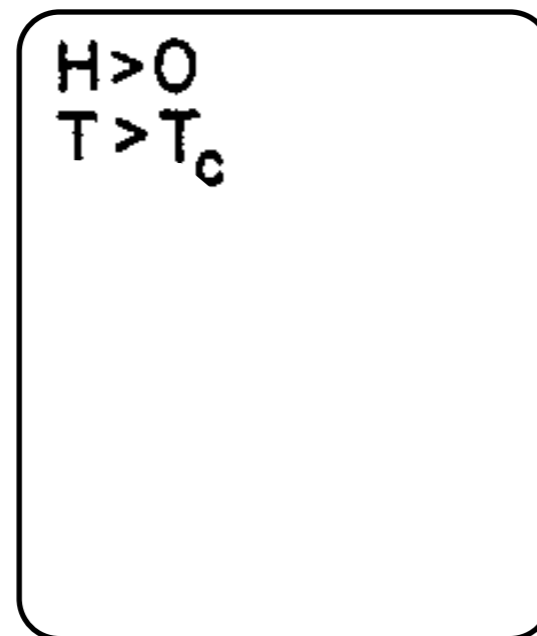
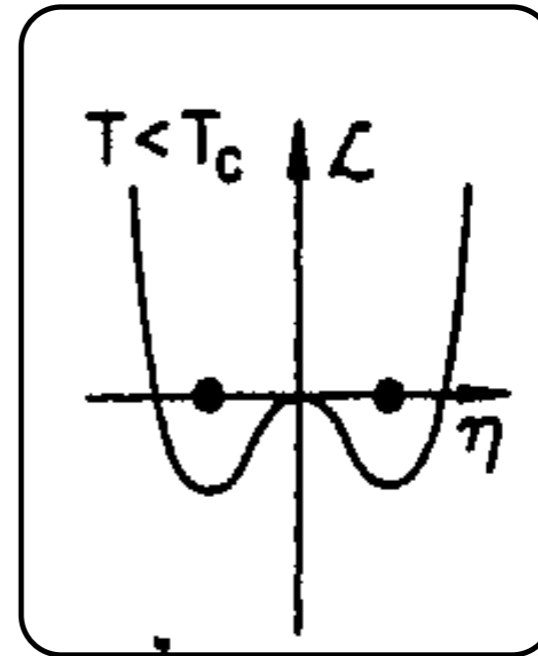
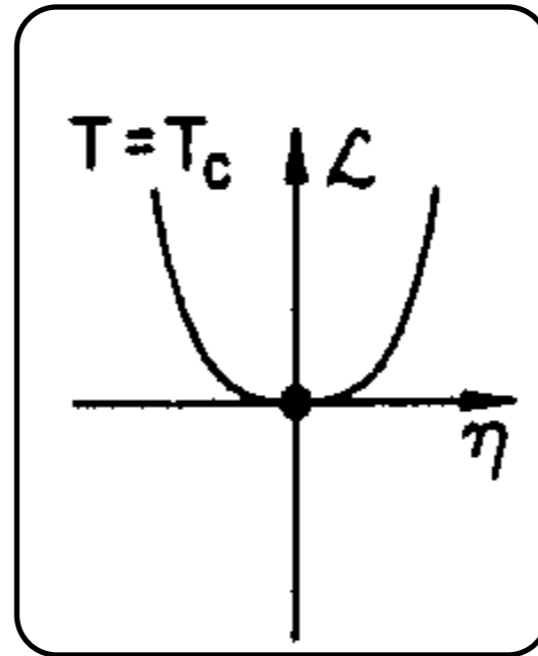
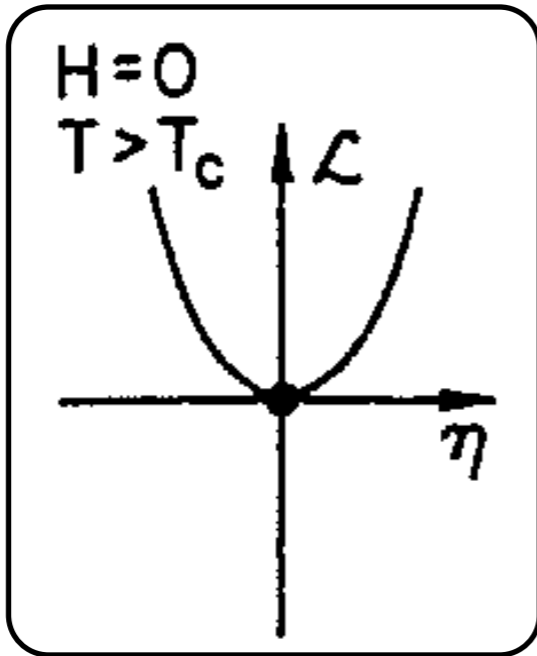
$T = T_c$

$T < T_c$



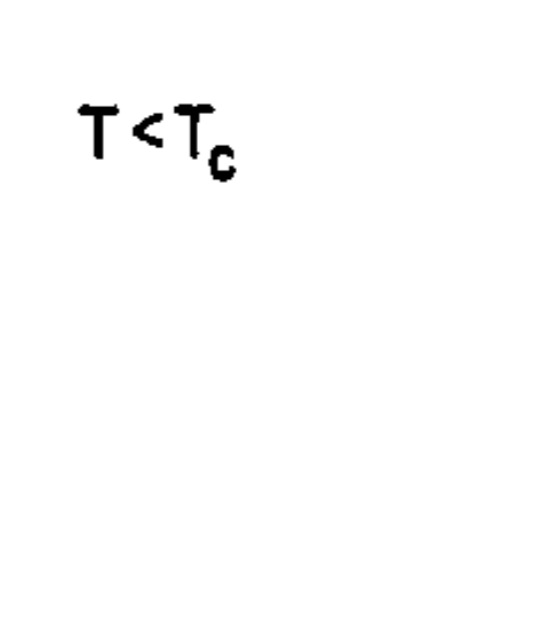
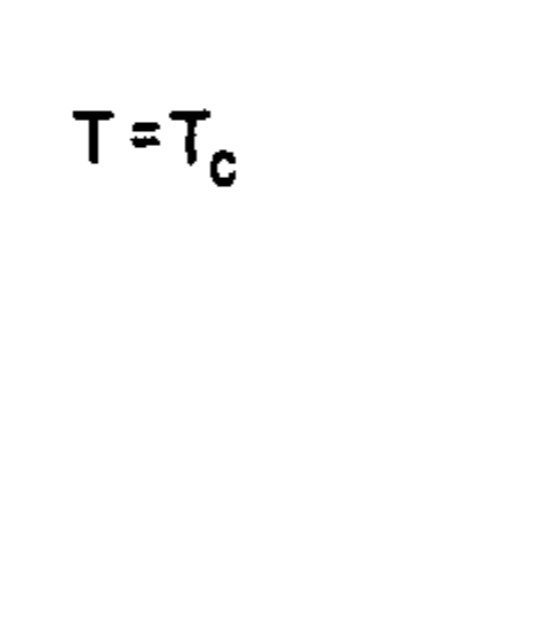
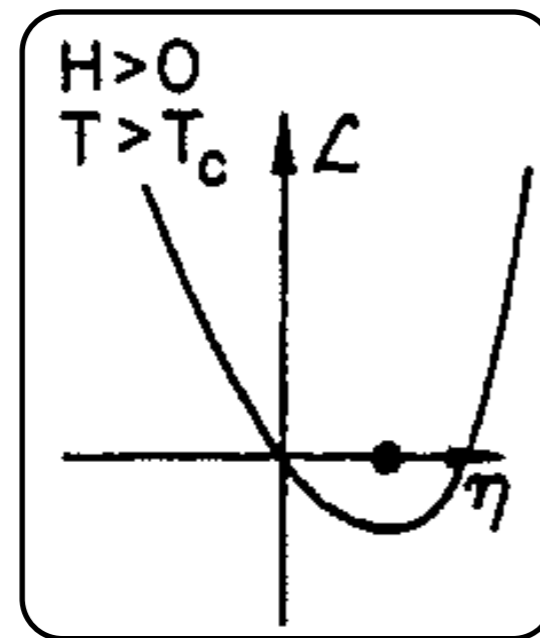
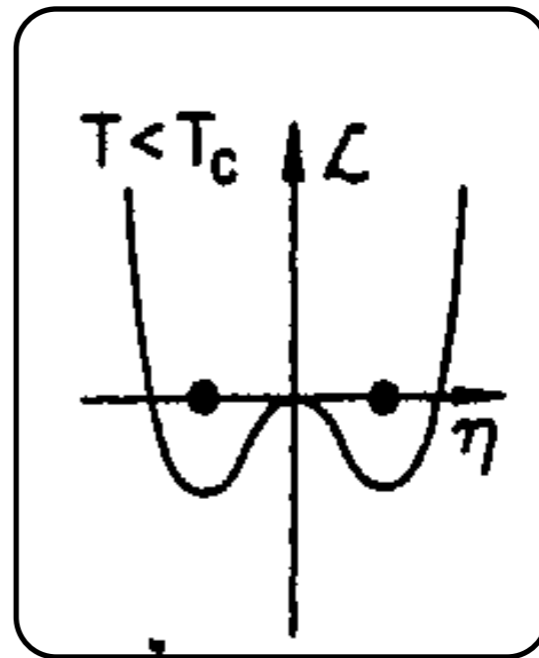
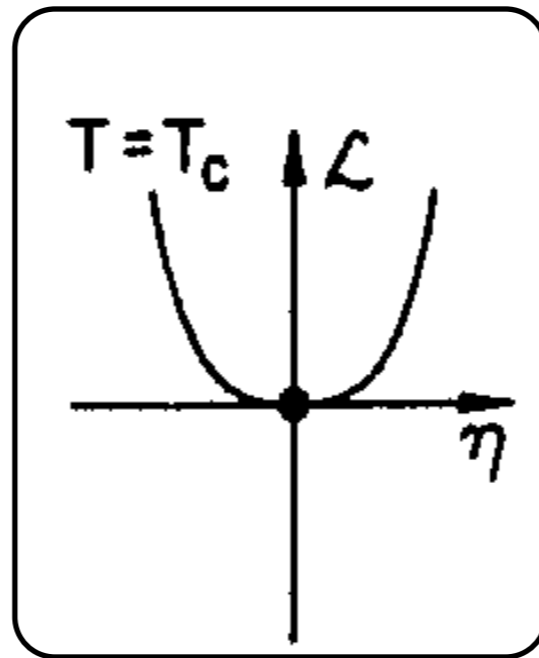
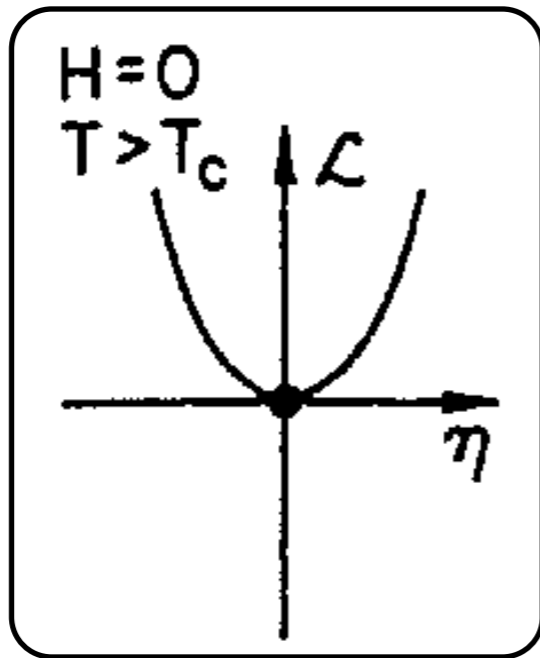
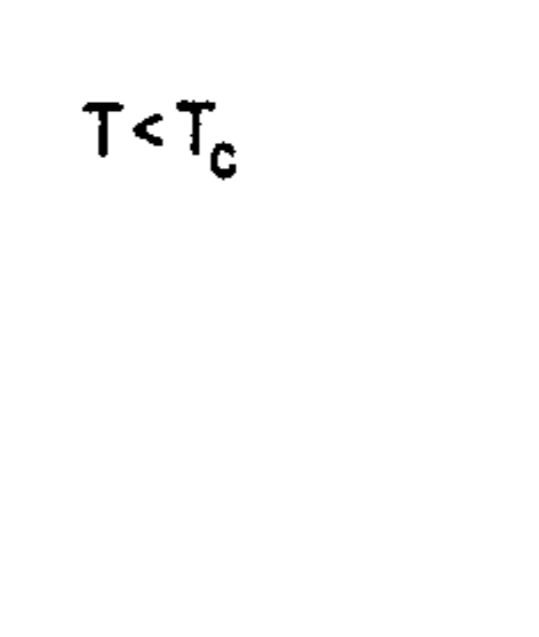
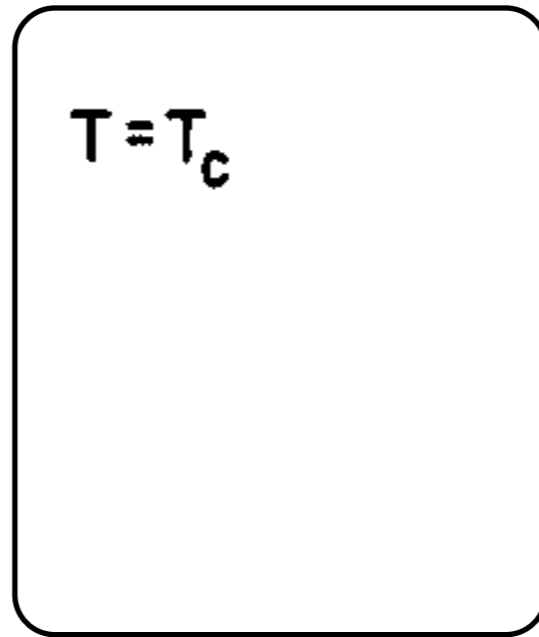
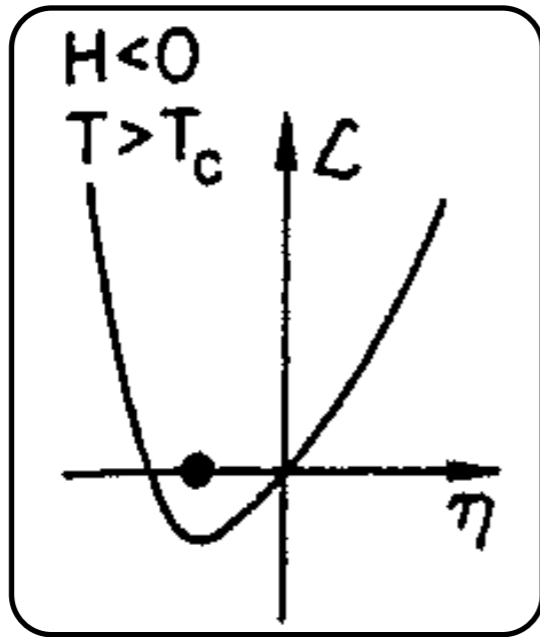
$T = T_c$

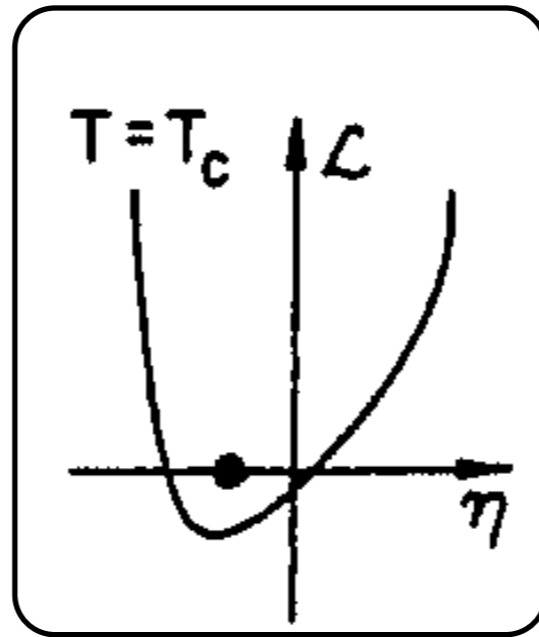
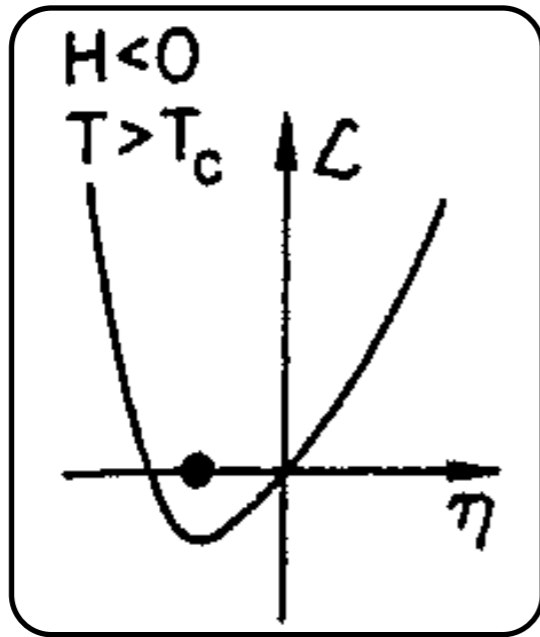
$T < T_c$



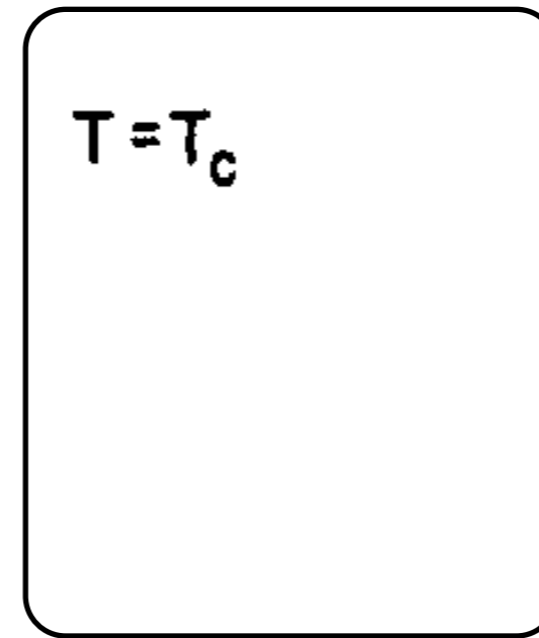
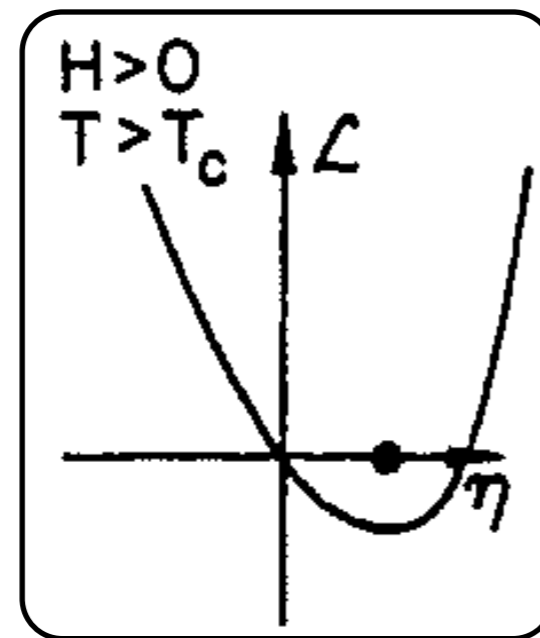
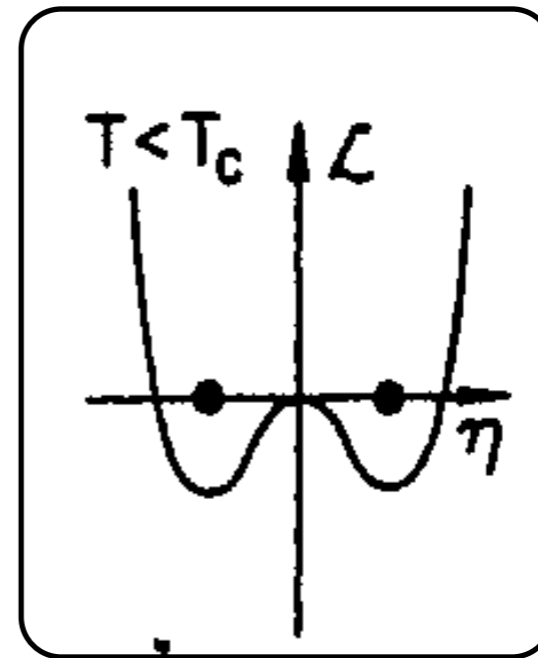
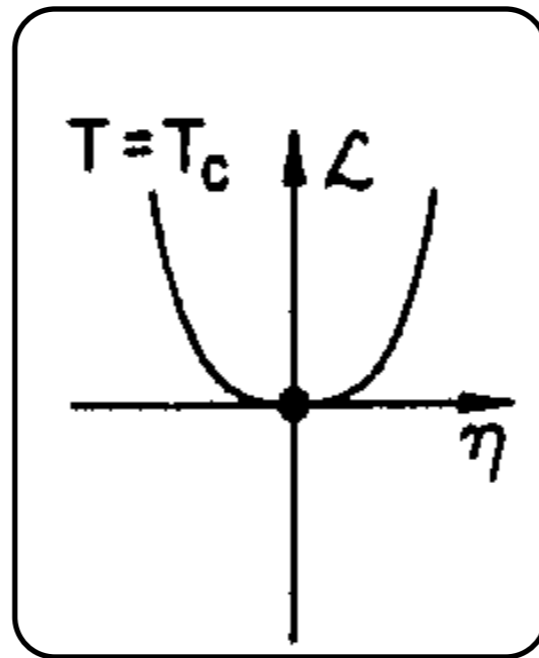
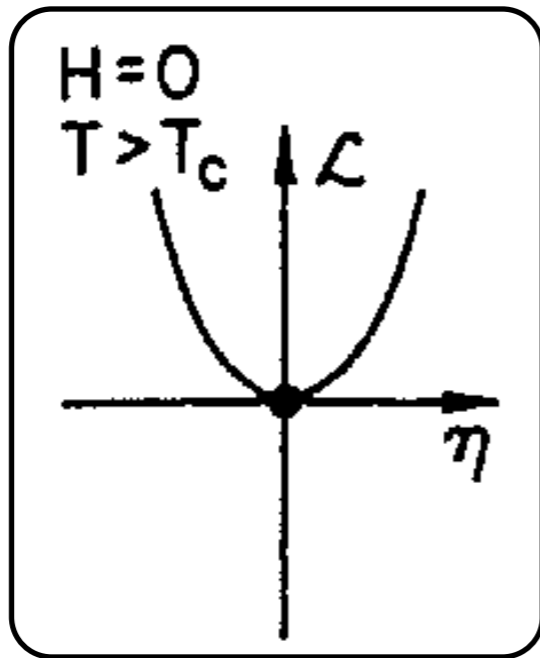
$T = T_c$

$T < T_c$



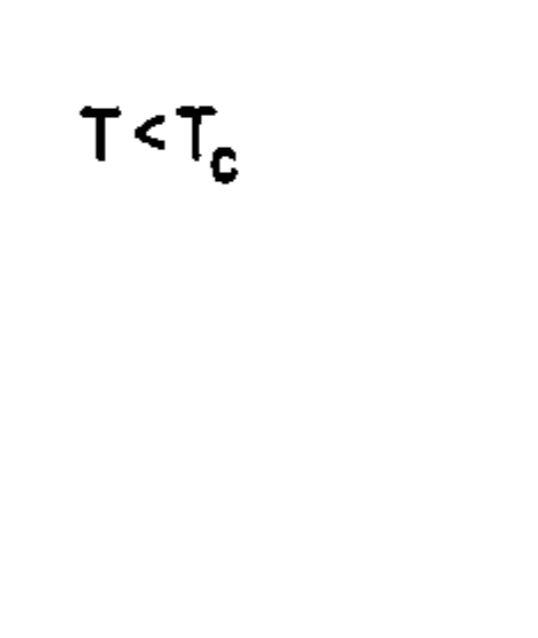
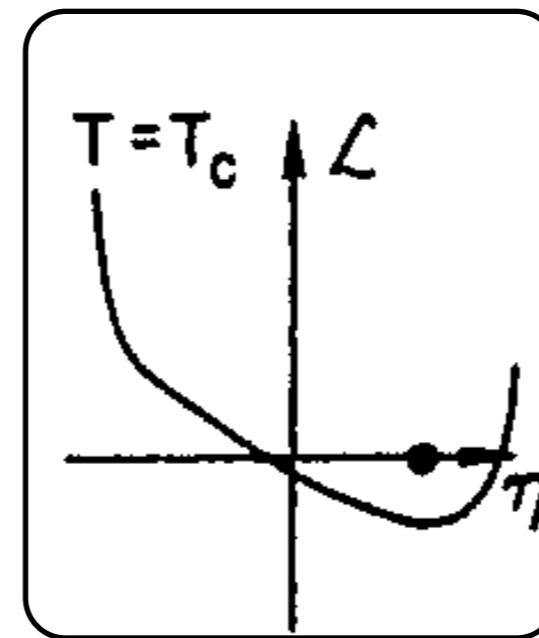
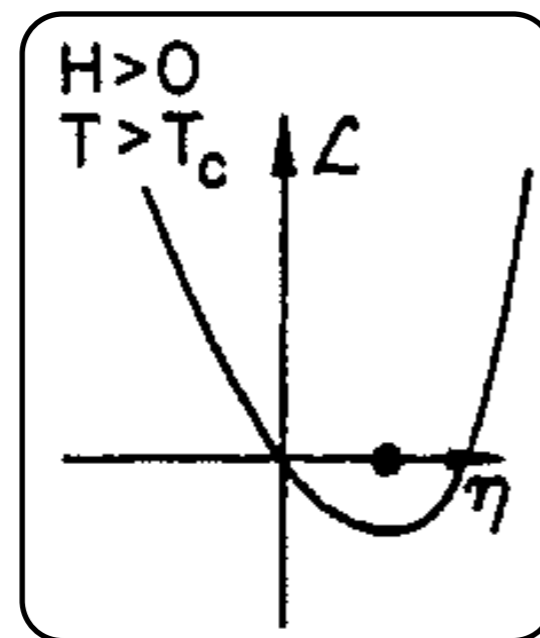
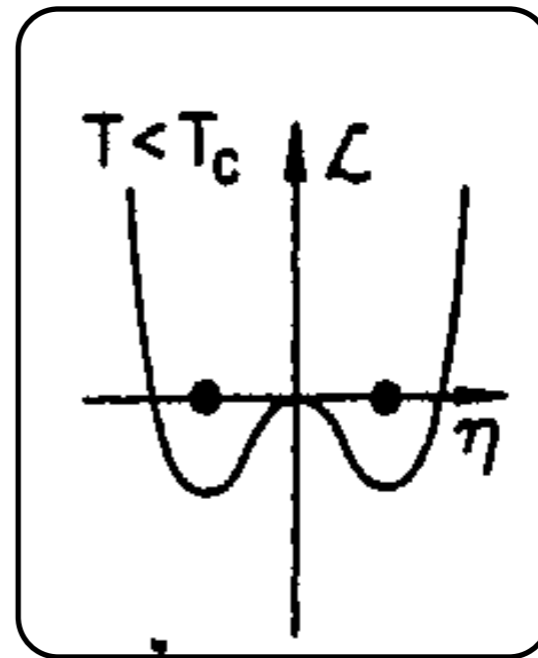
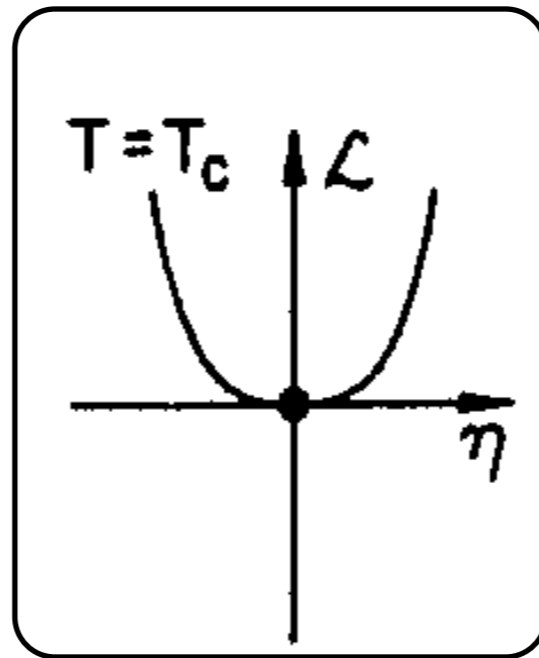
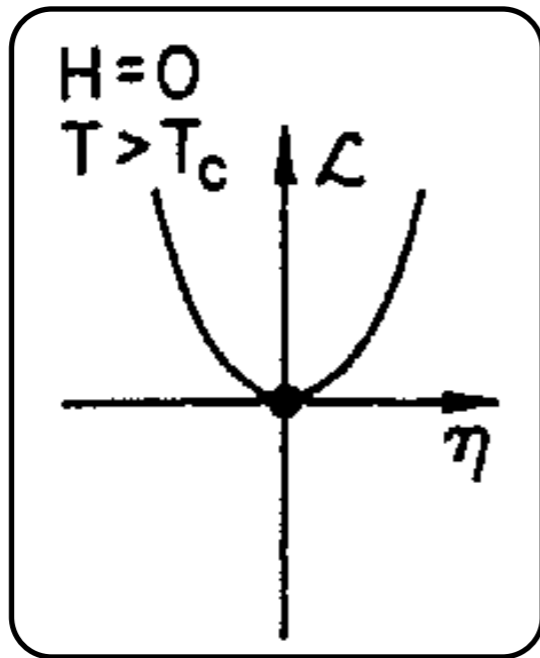
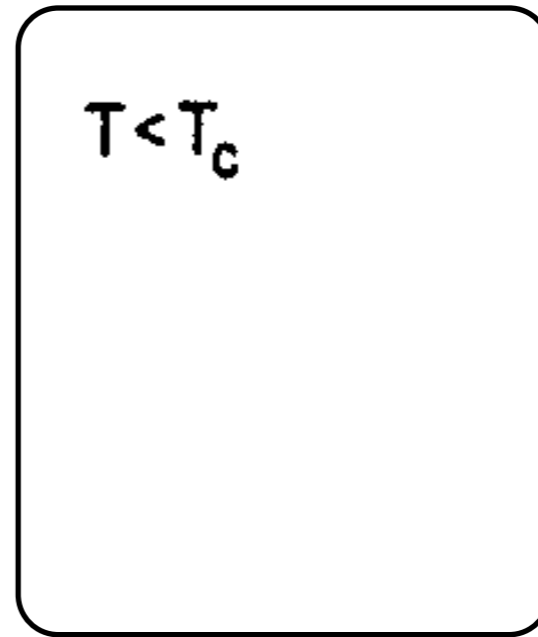
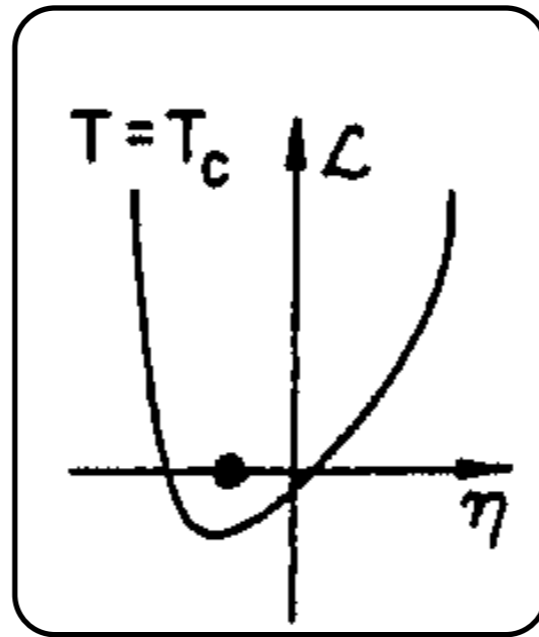
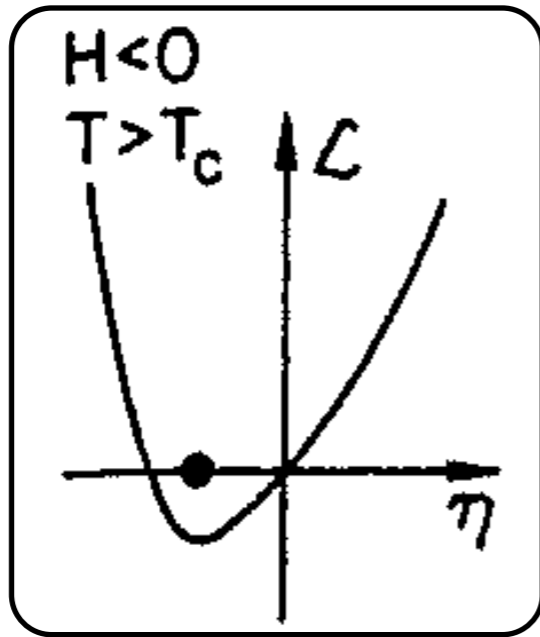


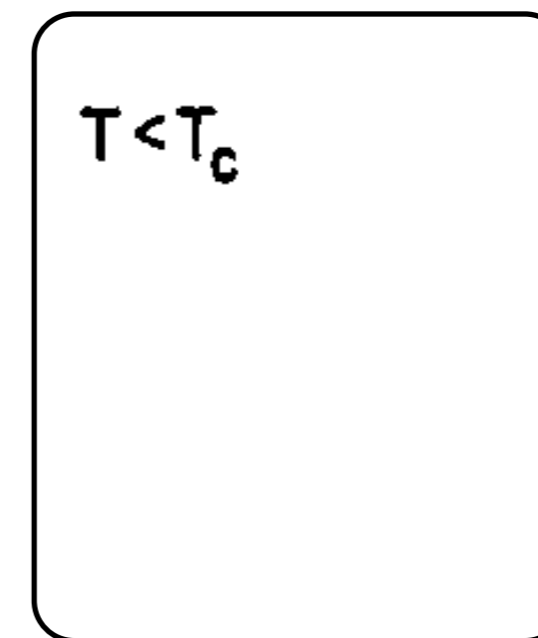
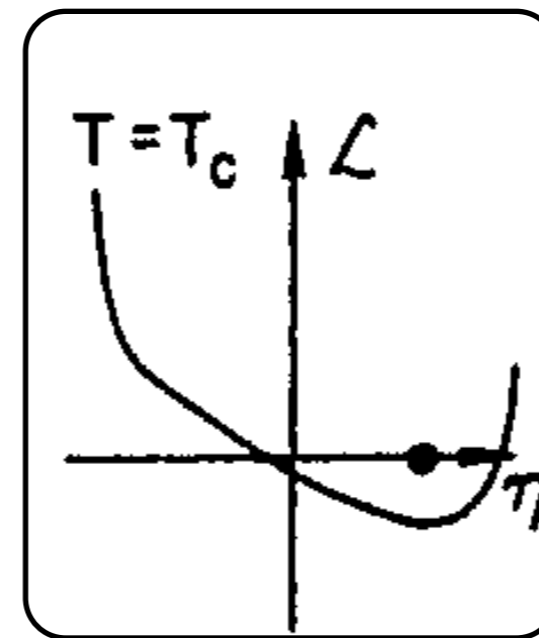
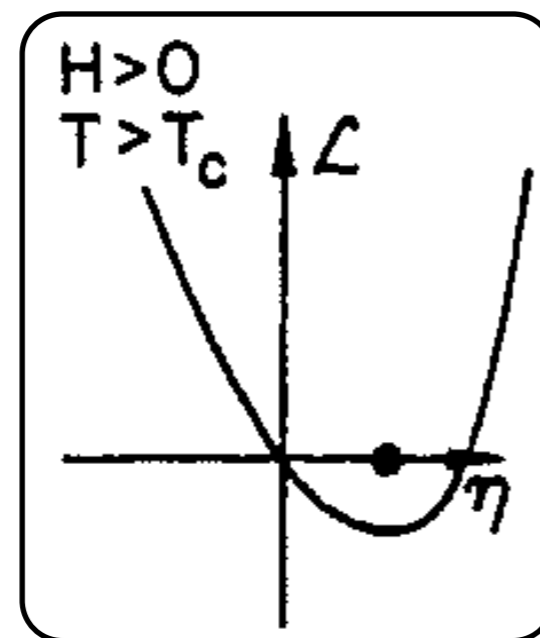
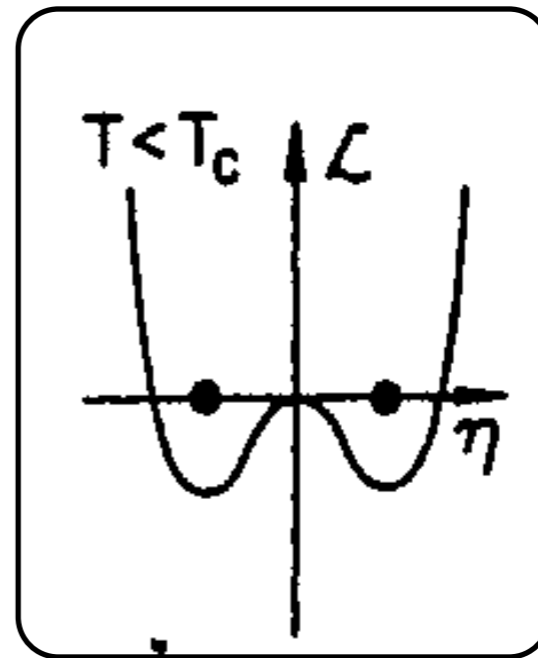
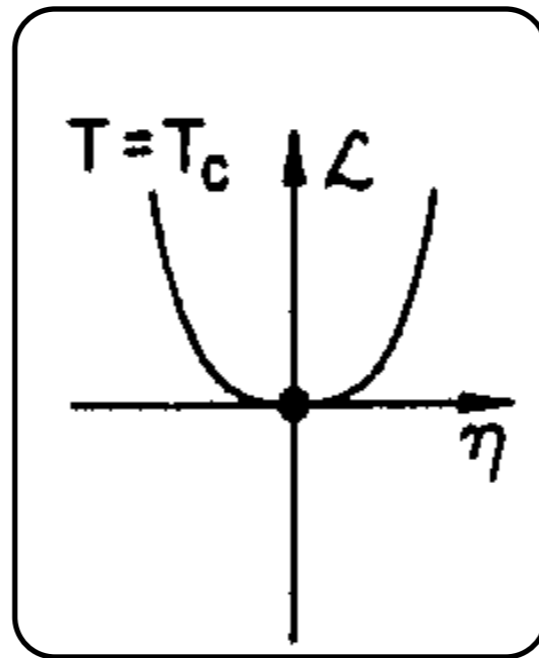
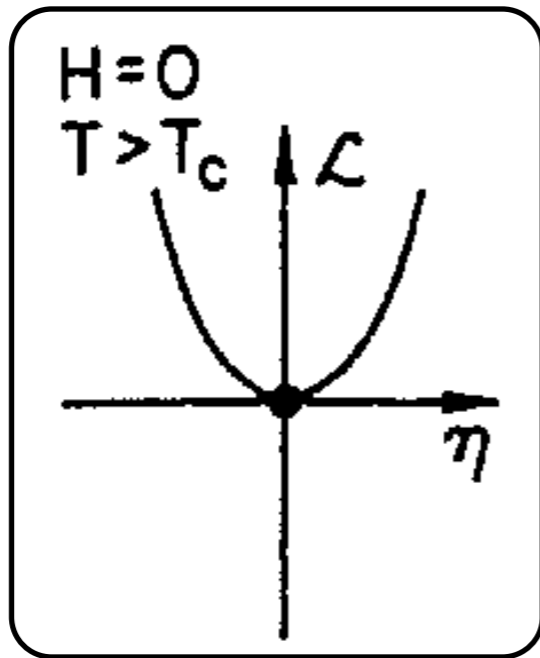
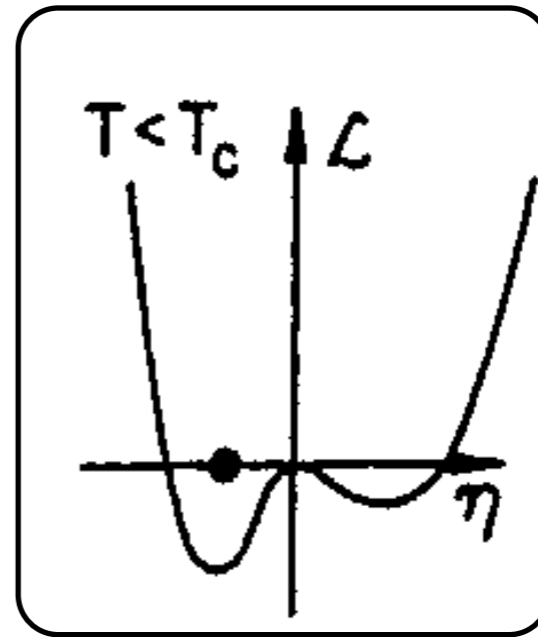
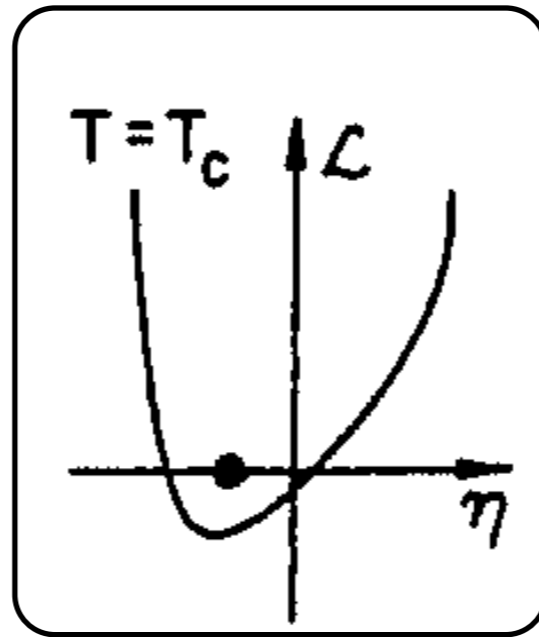
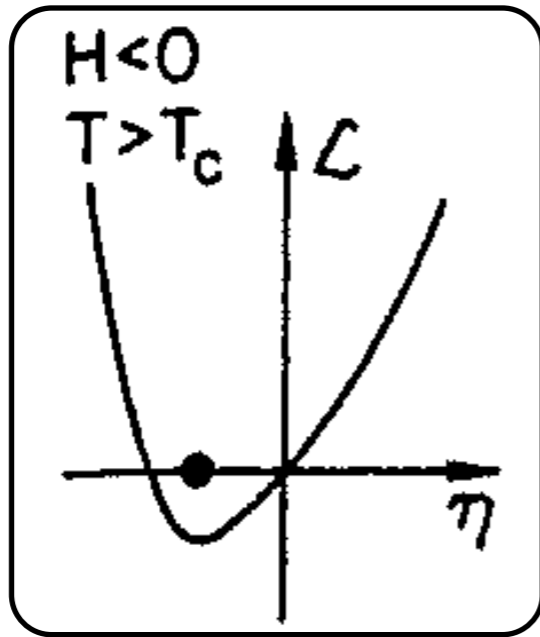
$T < T_c$

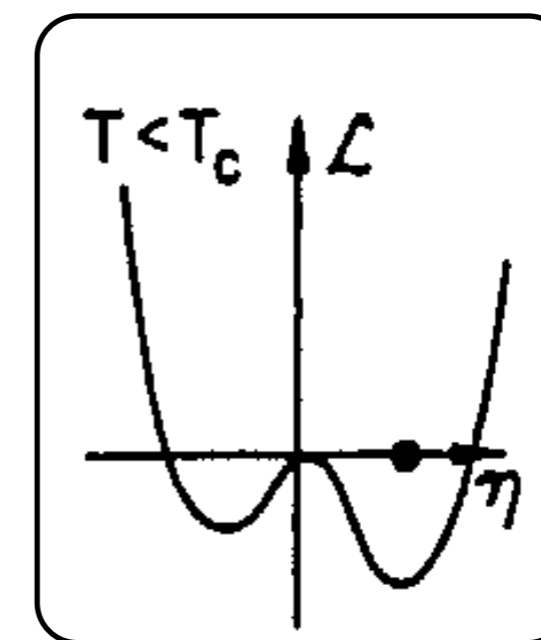
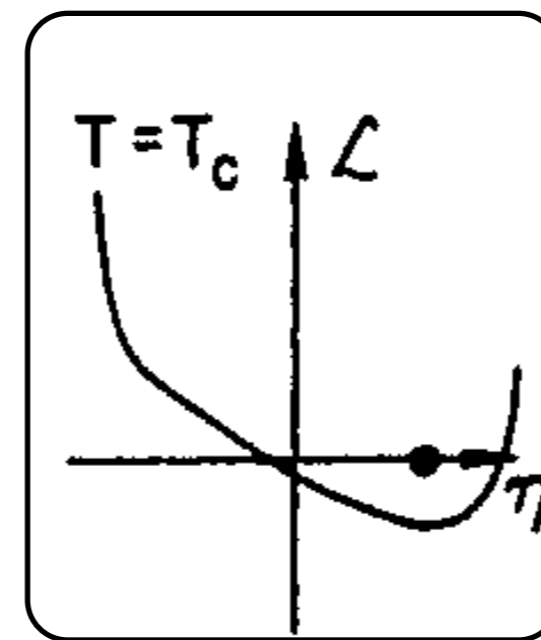
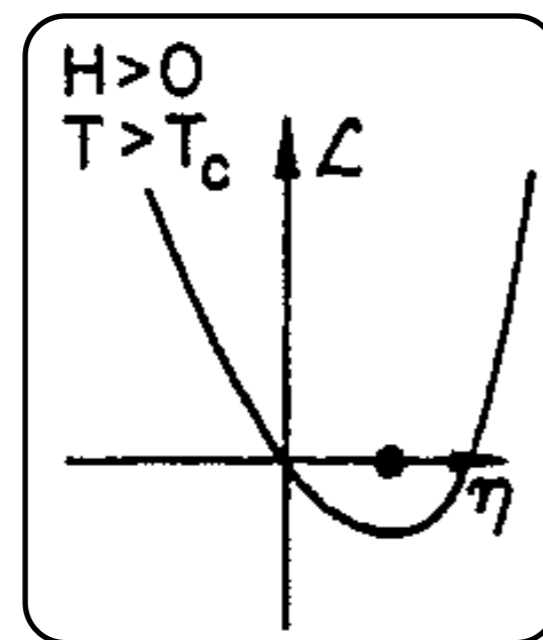
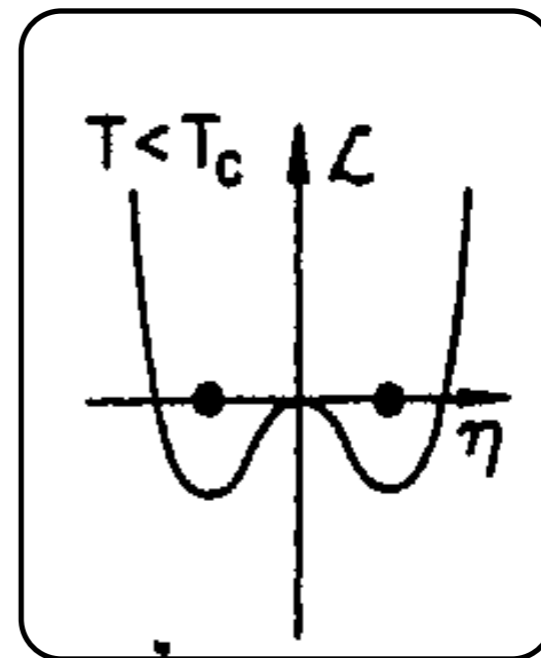
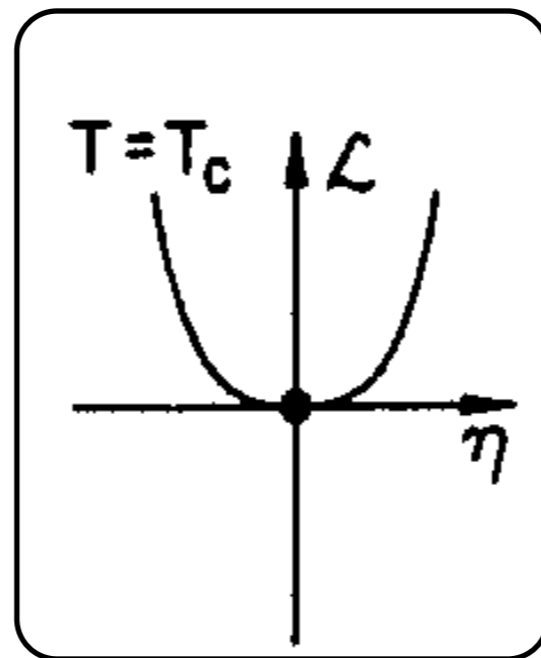
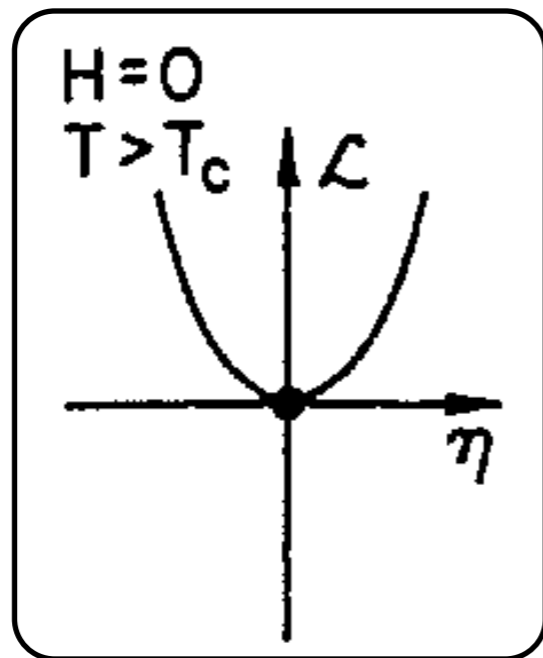
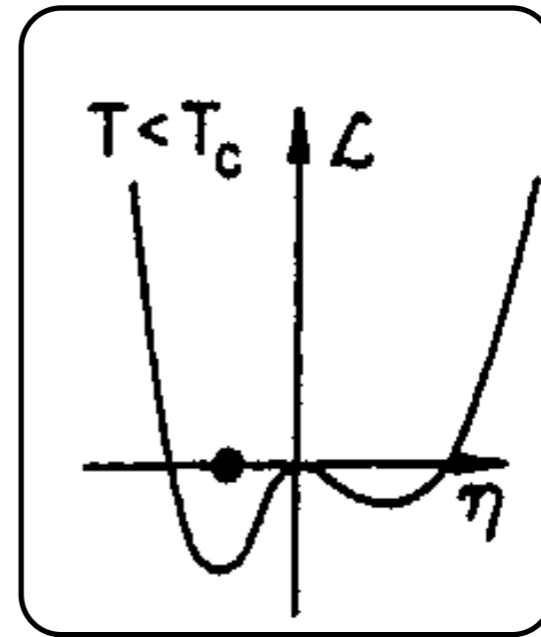
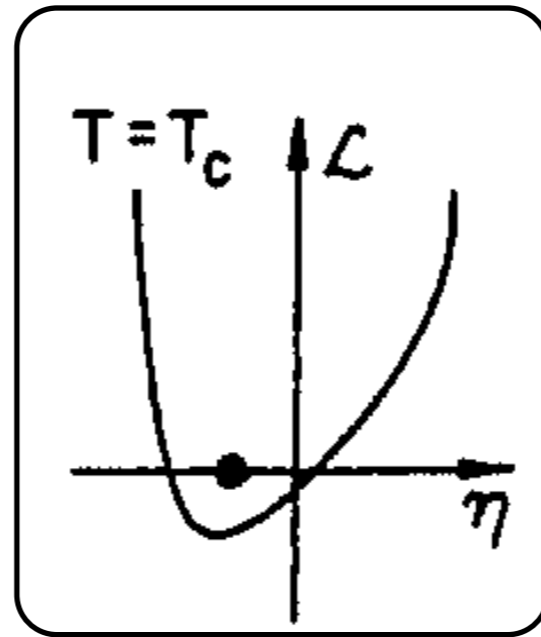
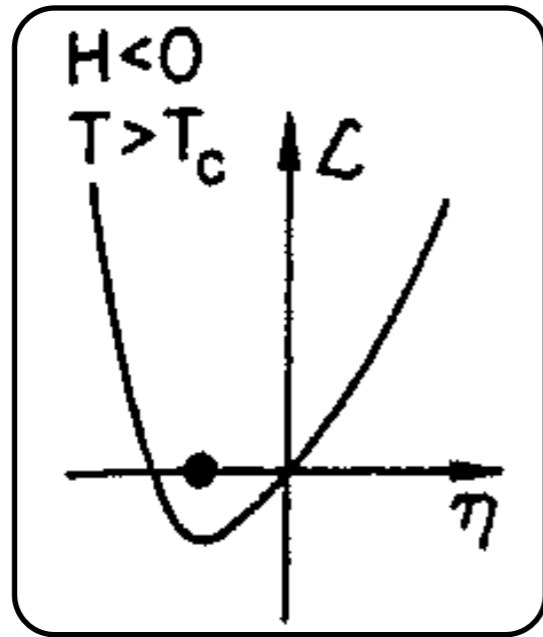


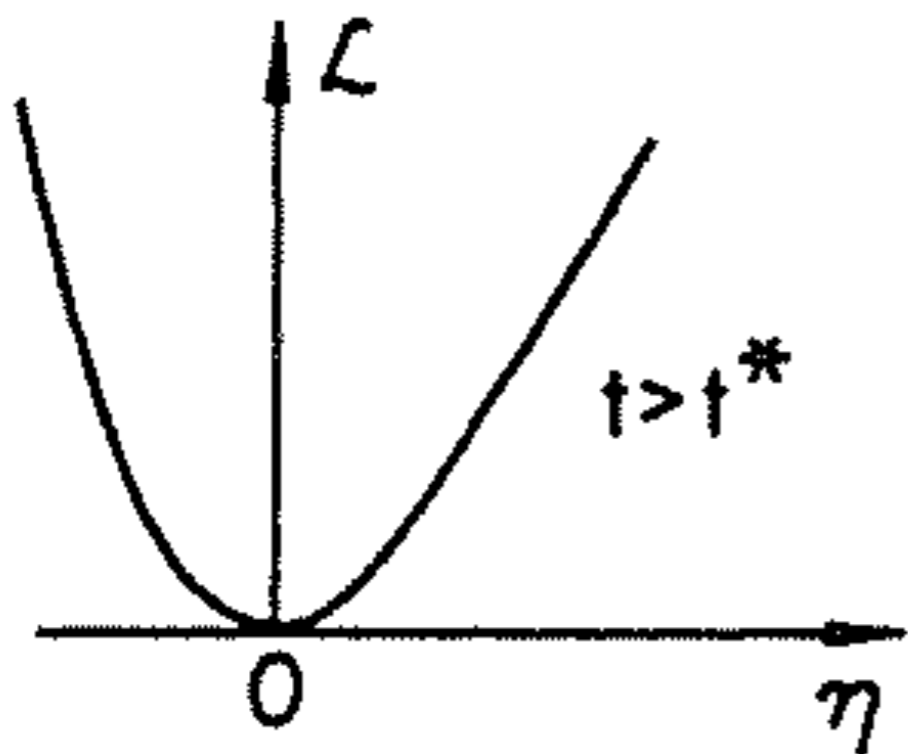
$T < T_c$







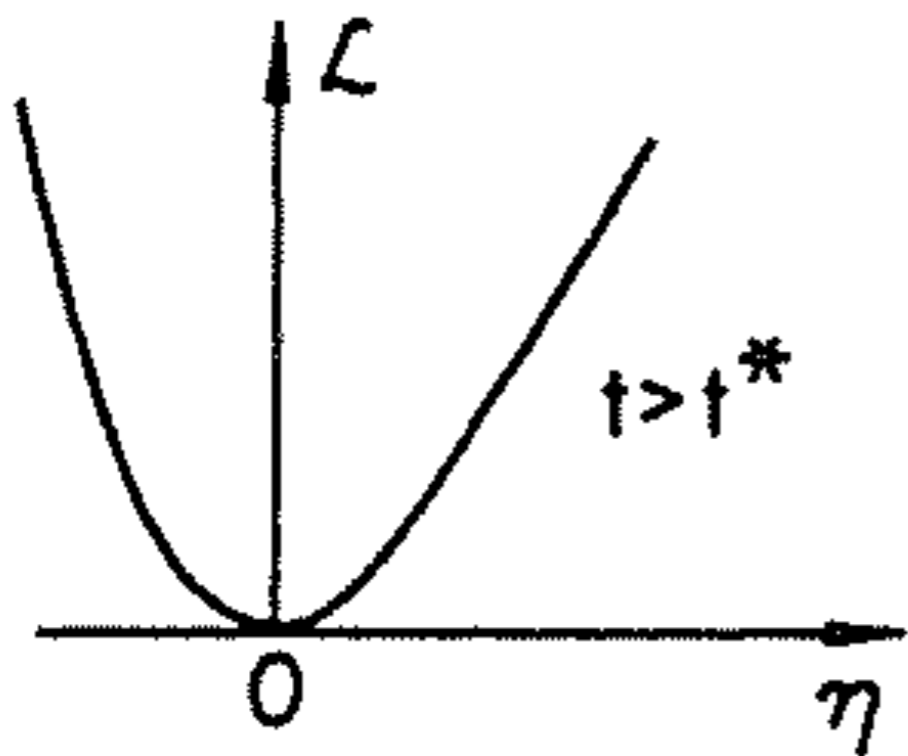




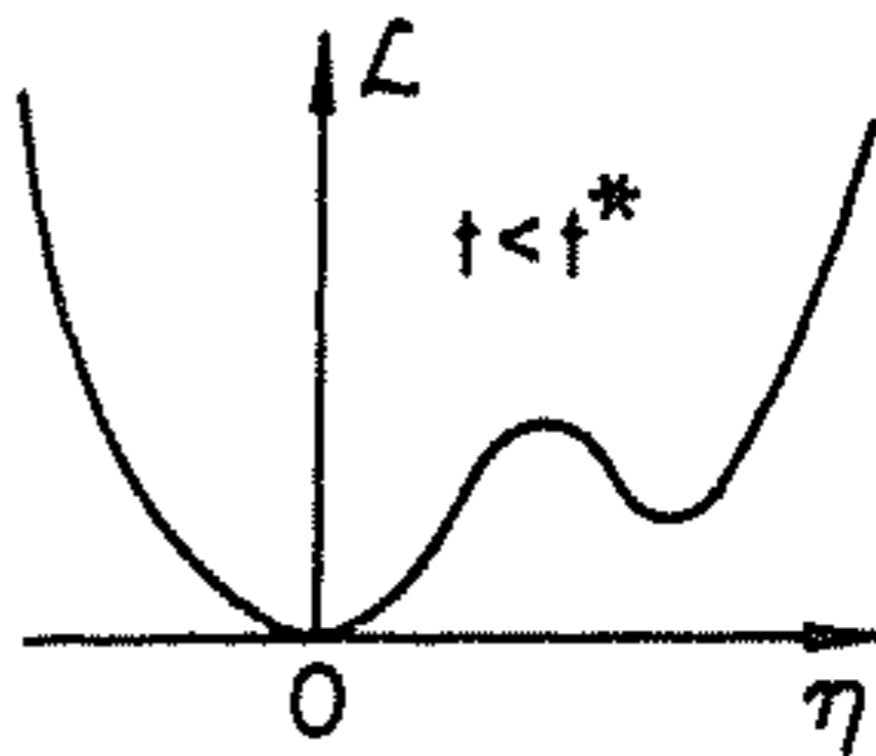
$$t < t^*$$

$$t = t_1$$

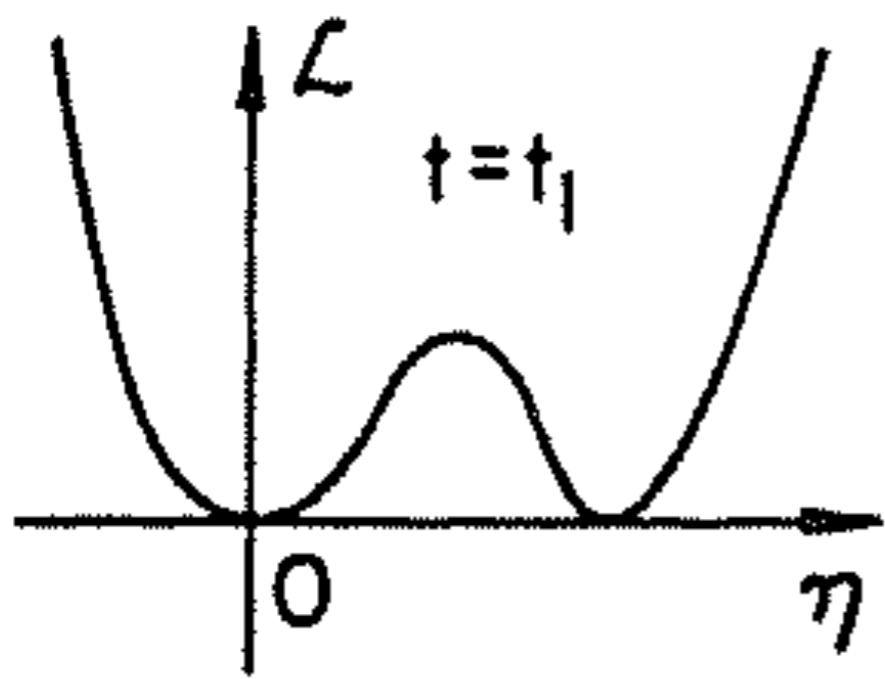
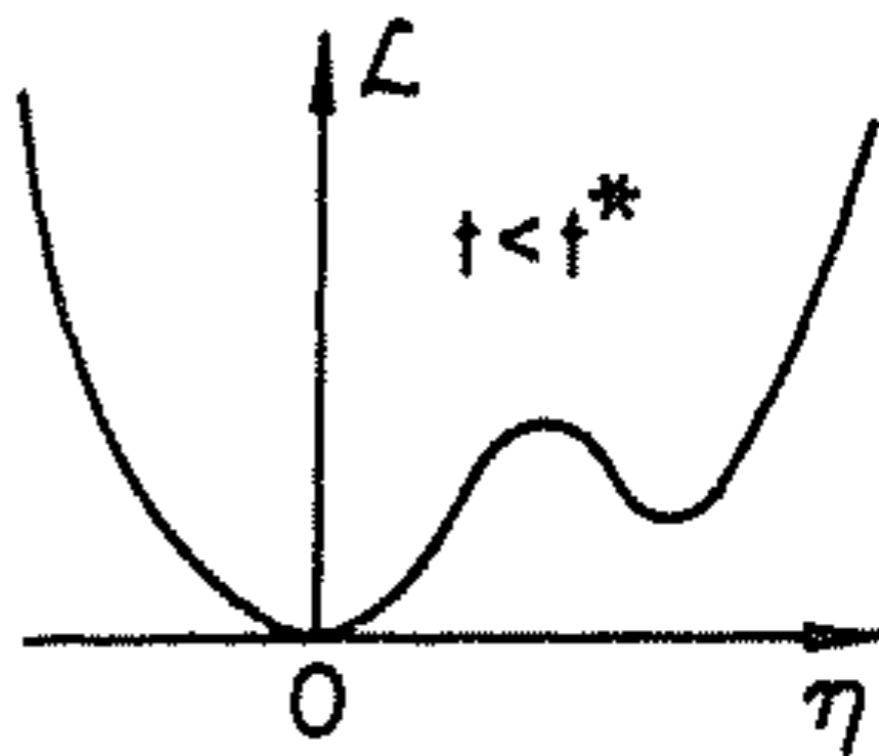
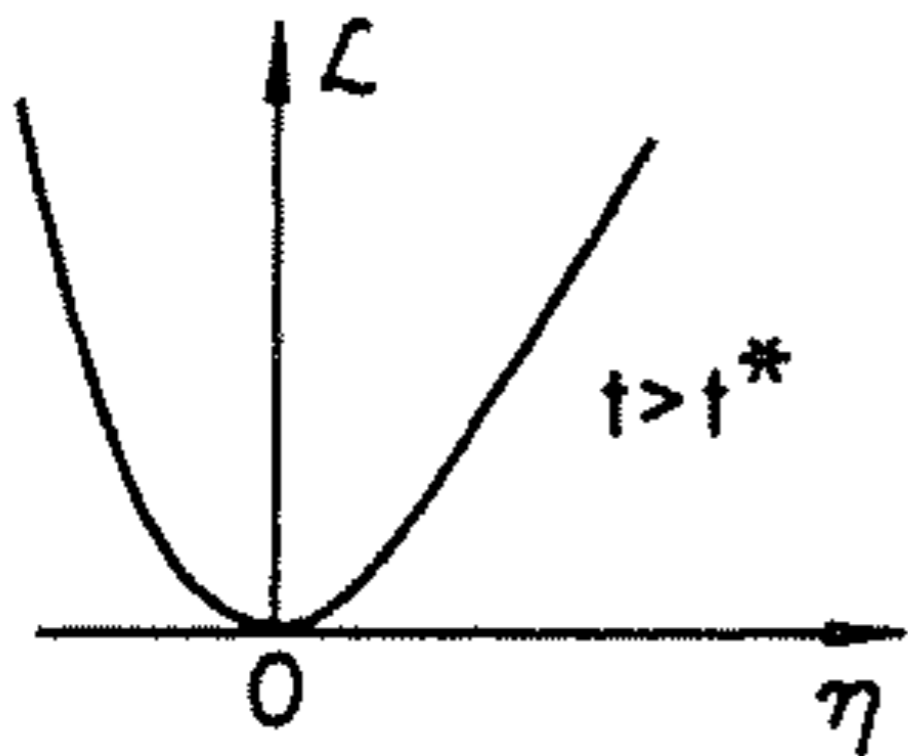
$$t < t_1$$



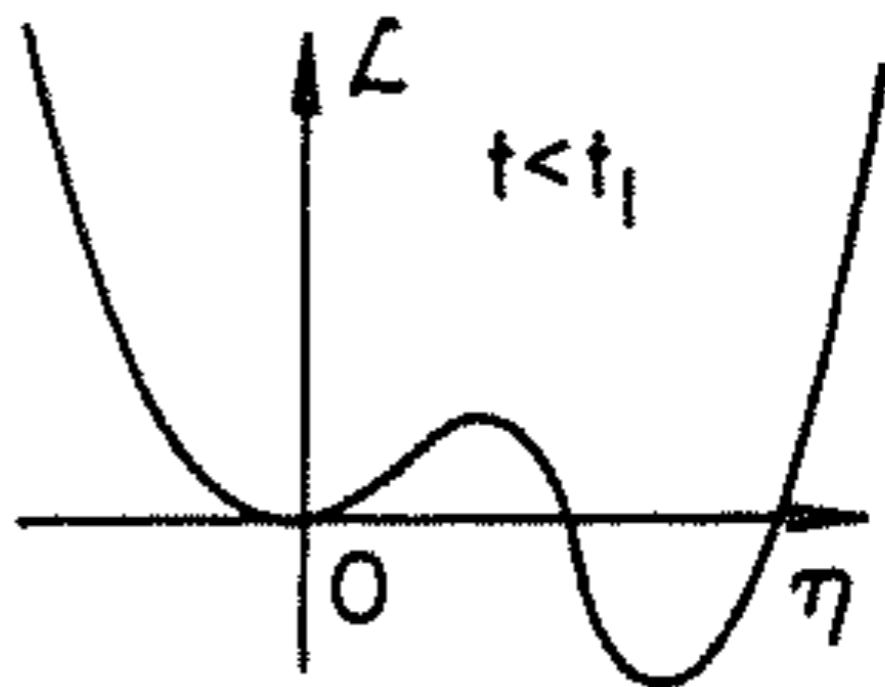
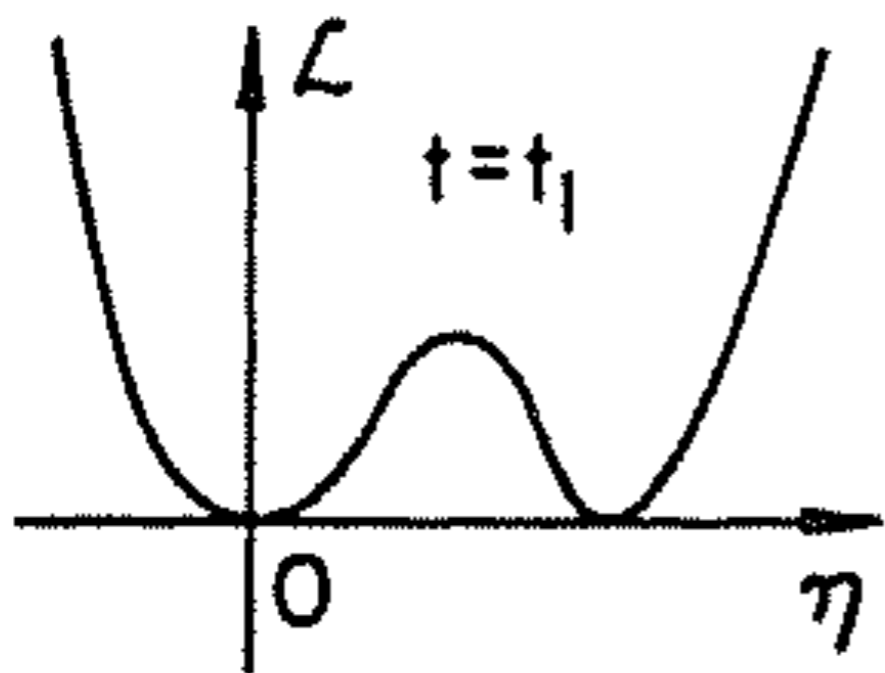
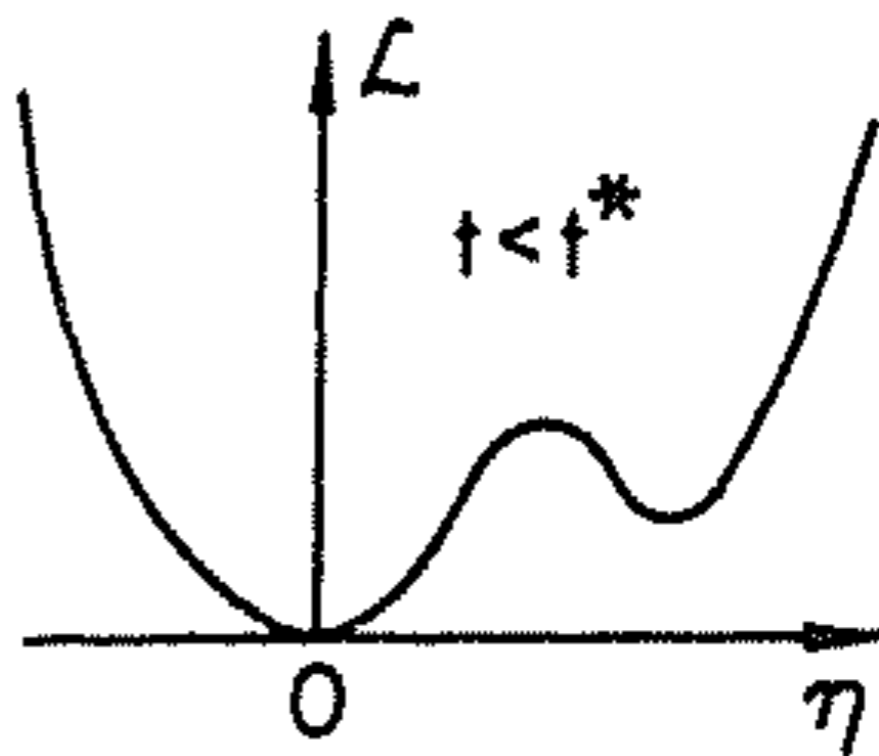
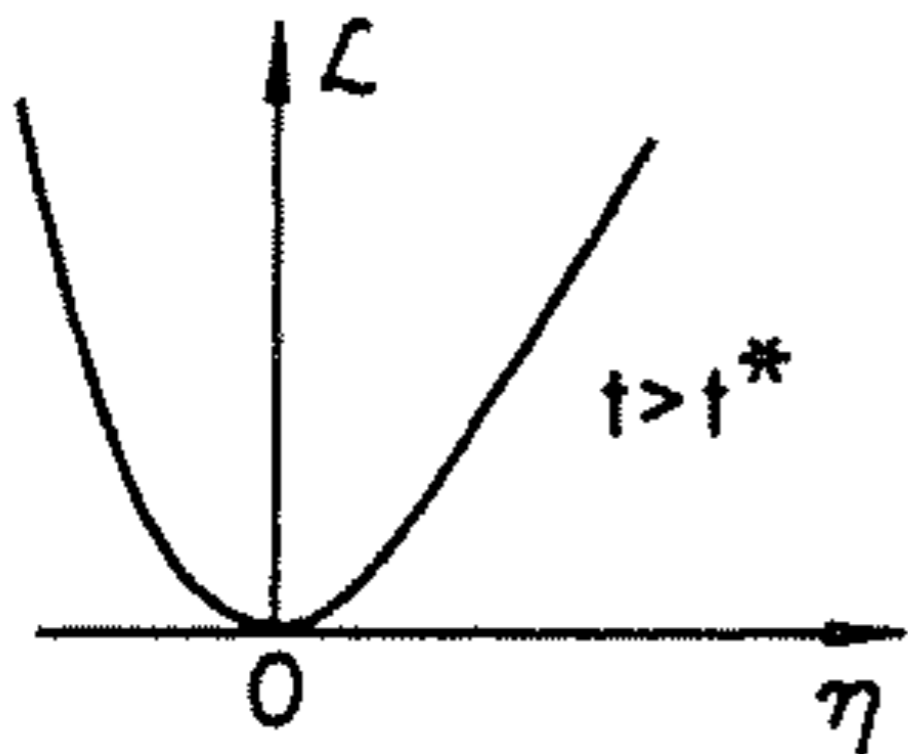
$$t = t_1$$



$$t < t_1$$



$t < t_1$



**Table 3.1 CRITICAL EXPONENTS FOR THE ISING UNIVERSALITY CLASS**

Exponent	Mean Field	Experiment	Ising ( $d = 2$ )	Ising ( $d = 3$ )
$\alpha$	0 (disc.)	0.110 - 0.116	0 (log)	0.110(5)
$\beta$	1/2	0.316 - 0.327	1/8	0.325±0.0015
$\gamma$	1	1.23 - 1.25	7/4	1.2405±0.0015
$\delta$	3	4.6 - 4.9	15	4.82(4)
$\nu$	1/2	0.625±0.010	1	0.630(2)
$\eta$	0	0.016 - 0.06	1/4	0.032±0.003

$$C_T = T \frac{\partial S}{\partial T} \sim |T - T_c|^{-\alpha}$$

$$m = \frac{\partial f}{\partial B} \sim |T - T_c|^\beta$$

$$\chi_T = \left. \frac{\partial m}{\partial B} \right|_T \sim |T - T_c|^{-\gamma}$$

$$m \sim B^{1/\delta} \quad (T = T_c)$$

$$\xi \sim |T - T_c|^{-\nu}$$

$$G(\mathbf{r} - \mathbf{r}') = \langle \phi(\mathbf{r})\phi(\mathbf{r}') \rangle \sim |\mathbf{r} - \mathbf{r}'|^{-D+2-\eta} \quad (T = T_c)$$



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note:  
not all critical exponents  
are independent  
(just two independent,  
**scaling laws**)

$$C_T = T \frac{\partial S}{\partial T} \sim |T - T_c|^{-\alpha}$$

$$m = \frac{\partial f}{\partial B} \sim |T - T_c|^\beta$$

$$\chi_T = \left. \frac{\partial m}{\partial B} \right|_T \sim |T - T_c|^{-\gamma}$$

$$m \sim B^{1/\delta} \quad (T = T_c)$$

$$\xi \sim |T - T_c|^{-\nu}$$

$$G(\mathbf{r} - \mathbf{r}') = \langle \phi(\mathbf{r})\phi(\mathbf{r}') \rangle \sim |\mathbf{r} - \mathbf{r}'|^{-D+2-\eta} \quad (T = T_c)$$