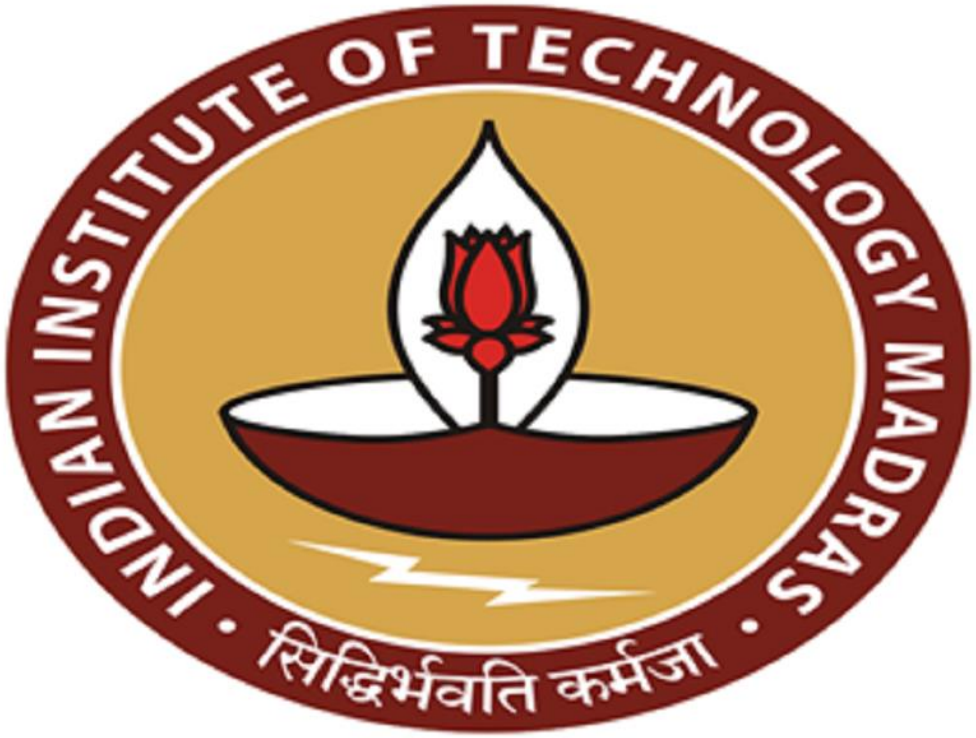

IIT Madras

ONLINE DEGREE

Quadratic Equations

Solve by Completing the Square

Solving a Quadratic Equations by Completing the Square

Old Method:

$x^2+10x-24=0$

abcd=-24 and ad+bc= 10

ad=12, and bc=-2. So

$x^2+10x-24=x^2+12x - 2x -24$

$=x(x+12)-2(x+12)$

$=(x+12)(x-2)=0$

That is, -12 and 2 are the real roots of the equation.

New Method:

$x^2+10x=24$

Observe that $(x+a)^2= x^2+2ax+a^2$. Using this write 10=2x5 and add 25 on both sides of the equation to get

$x^2+10x + 25= 24 +25 = 49$

$(x+5)^2=7^2$

$(x+5) = \mp 7$

Therefore, x = -5+7=2 and x=-5-7=-12 are the roots of the quadratic equation.