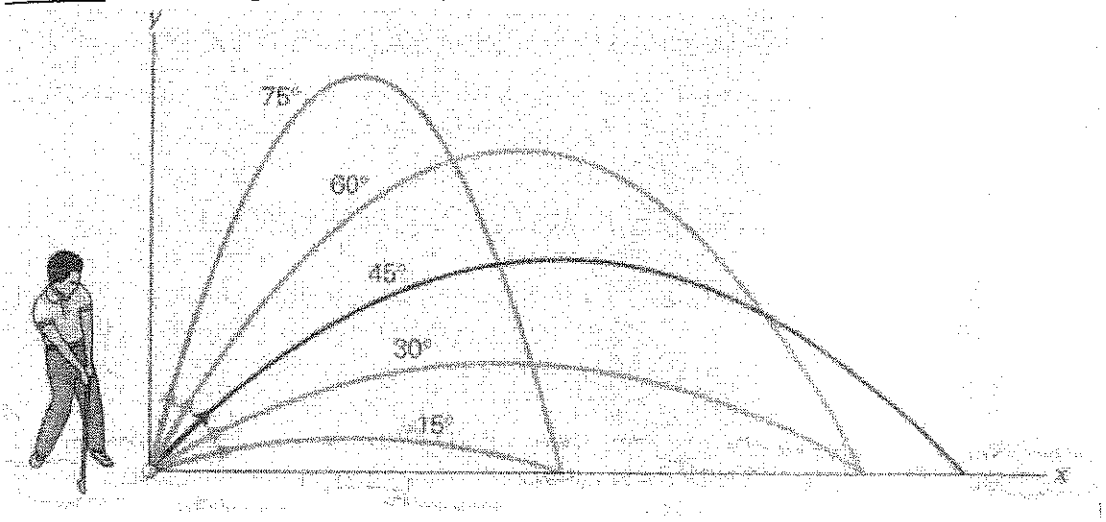
Skill 18: Launch Angle vs dx and dy



For any given launch velocity:

-**The greatest horizontal displacement occurs at an angle of 45 degrees** or the angle closest to 45 degrees. Any two angles equal distance from 45 degrees will land in the same location (ie 30 degrees/60 degrees OR 15 degrees/75 degrees).

-**The greatest vertical displacement at mid-point (height) is at 90 degrees or closest to 90 degrees.**

Example: A golf ball is hit from level ground with a launch velocity or 40 m/s at various launch angles.

	v_{iy}	v_{ix}	t	d_x	Max d_y at t/2
	$v_{iy}=v_i\sin\Theta$	$v_{ix}=v_i\cos\Theta$	$t=\frac{2v_{iy}}{g}$	$d_x=v_xt$	$d=1/2\ at^2$ where t is the ½ time
15	10.35 m/s	38.6 m/s	2.11s	81.5m	5.46m
30	20m/s	34.64 m/s	4.08s	141.4m	20.41m
45	28.28 m/s	28.28 m/s	5.77s	**163.18m**	40.83m
60	34.64 m/s	20 m/s	7.07s	141.4m	61.3m
75	38.6 m/s	10.35 m/s	7.88s	81.5m	**76.1m**