The tension of (1) is P; the weight supported at A_1 is double the tension of (1), and therefore $= 2\,P$, and this is the tension of (2).

The weight supported at A_2 is double the tension of (2) and therefore $= 2\,(2\,P) = 2^2\,P$, and this is the tension of (3).

The weight supported at A_3 is double the tension of (3), and therefore $= 2\,(2^2\,P) = 2^3\,P$, and this is the tension of (4).

Proceeding in this way, we come at last to the weight supported at $A_n = 2^n\,P$, and this is the attached weight. Hence,

$$W = 2^n\,P,$$

and the mechanical advantage is 2^n.

Cor. 1. The mechanical advantage is doubled by every additional pully.

Pullies supposed heavy

Cor. 2. The weight of the pullies may be readily taken into account by observing that, from the preceding, the force required to support a weight W on n moveable pullies is $\frac{W}{2^n}$.

Let w_1, w_2, w_3, ... be the weights of the several pullies, blocks included. Each of these weights may be supposed a weight attached to its block, and supported on the system of pullies above it.

The power required to support w on one moveable pully is $\frac{w_1}{2}$.

	"	"	"	w_2 on two	"	pullies is $\frac{w_2}{2^2}$.
	"	"	"	w_3 on three	"	" $\frac{w_3}{2^3}$.
	"	"	"	w_n on n	"	" $\frac{w_n}{2^n}$.
Also	"		"	W on n	"	" $\frac{W}{2^n}$.