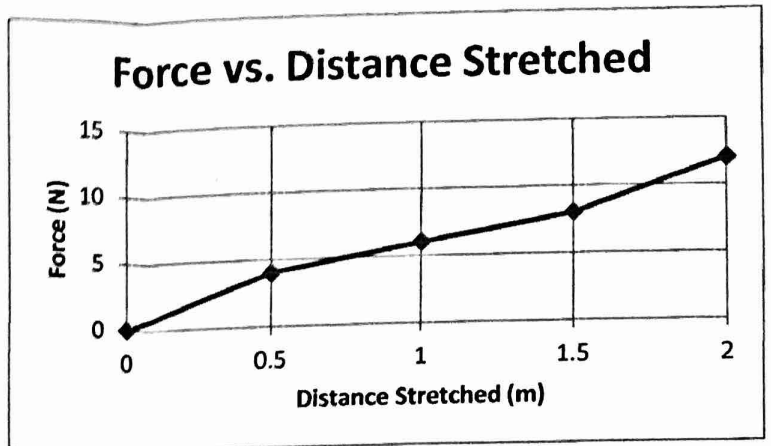
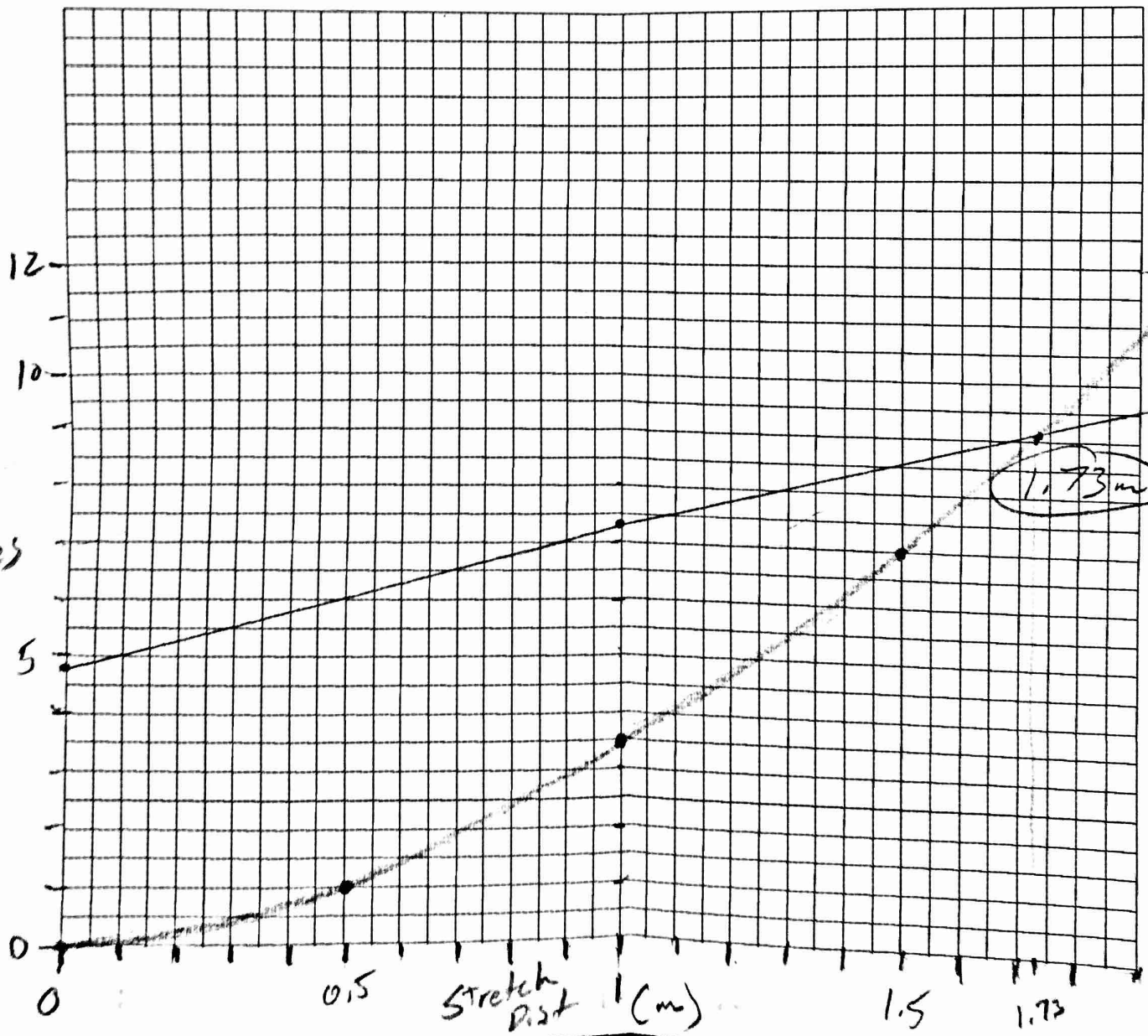


Name: Key

1. Starting from rest, a 0.25kg bungee-jumping object falls 2m vertically before beginning to stretch its bungee. If the graph on the right shows the forces that are necessary to hold the bungee stretched at a variety of distances, how far will the falling object stretch the bungee before the object comes to rest? Assume that the object does not hit any other object (e.g. the floor). Solve the problem graphically, using the graph space below.



Joules



1. When PE lost by jumper = work done on bungee, jumper comes to rest.

After falling 2m, jumper has lost 0.25 J

$$0.25 \text{ kg} (9.8 \text{ m/s}^2) (2 \text{ m}) = 4.9 \text{ J}$$

After 1 more meter, the jumper has lost

$$0.25 \text{ kg} (9.8 \text{ m/s}^2) (3 \text{ m}) = 7.35 \text{ J}$$

These points correspond to 0m stretch and 1m stretch, respectively

Work done on bungee	Stretch (m)	F (N)	Previous Interval			Total work (J)
			Avg F (N)	Dist (m)	Work (J)	
	0	0	0	0	0	0
	0.5	4	2	0.5	1	1
	1	6	5	0.5	2.5	3.5
	1.5	8	7	0.5	3.5	7
	2	12	10	0.5	5	12

↑ max
 ↑ max