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

PE lost by Jumper

After falling 2m, jumper has lost

$0.25kg(9.8m/s^2)(2m) = 4.9J$

After 1 more meter, the jumper has lost

$0.25kg(9.8m/s^2)(3m) = 7.35J$

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

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Work done on bungee

Stretch (m)	F (N)	Previous Interval: Ave F (N)	Dist (m)	Work (J)	Total 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)

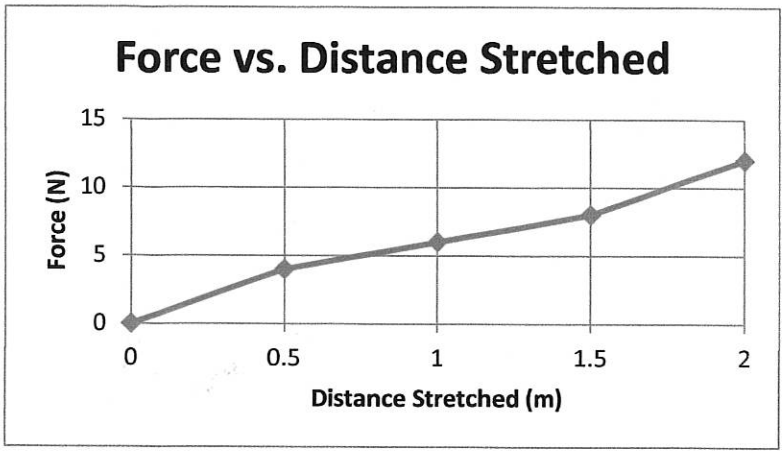
(2) ← max

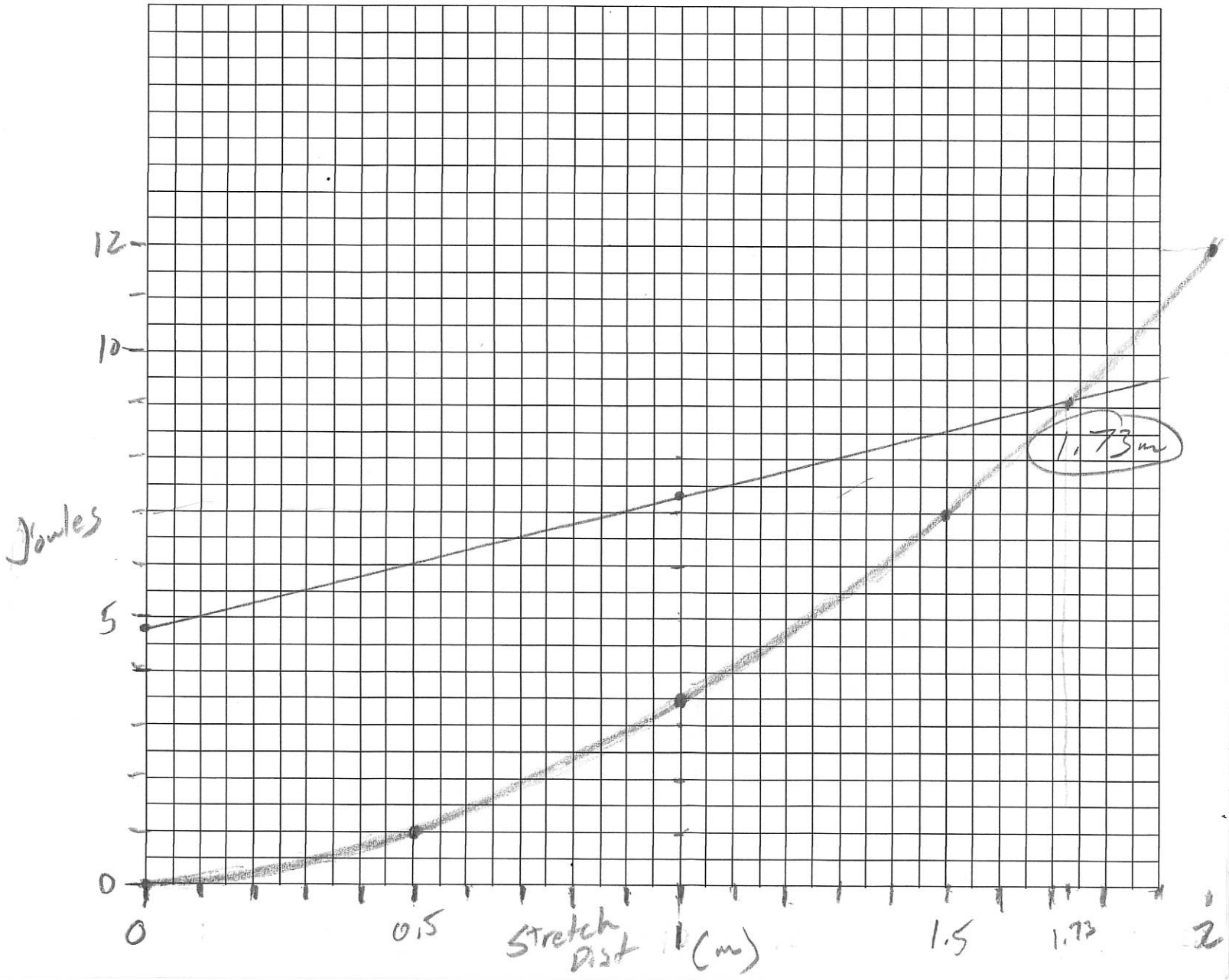
(12) ← max

Physics 200 (Stapleton)
Bungee Jumper Problems

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.





2. PE lost by jumper after falling:

Zero stretch → 1m ⇒ $0.5kg(9.8m/s^2)(1.5) = 7.35J$

4m stretch → 5m ⇒ $0.5kg(9.8m/s^2)(5.5m) = 26.95J$

		Previous Interval			
Stretch Dist (m)	Force (N)	Ave F (N)	Dist (m)	Work (J)	Total work (J)
0	0	0	0	0	0
1	6	3	1	3	3
2	8	7	1	7	10
3	12	10	1	10	20
(4)	20	16	1	16	(36)

max

max

1.5m

2. Starting from rest, a **0.5kg** bungee-jumping object falls ~~1m~~ 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.