

Solving simultaneous equations

- solve simultaneous equations in two unknowns by substitution
- solve simultaneous equations in two unknowns by elimination

Problem 1. Solve the following equations for x and y ,

(a) by substitution and

(b) (b) by elimination

$$x + 2y = -1 \quad (1)$$

$$4x - 3y = 18 \quad (2)$$

Problem 2. Solve, by a substitution method, the simultaneous equations

$$3x - 2y = 12 \quad (1)$$

$$x + 3y = -7 \quad (2)$$

Problem 3. Use an elimination method to solve the following simultaneous equations

$$3x + 4y = 5 \quad (1)$$

$$2x - 5y = -12 \quad (2)$$

Calculator Practice revision

Use your calculator to

1. Evaluate $\cos 63.74^\circ$ correct to 4 decimal places
2. Evaluate $\tan 39.55^\circ - \sin 52.53^\circ$ correct to 3 decimal places
3. Evaluate $\sin(0.437 \text{ rad})$ correct to 4 decimal places
4. Evaluate $\frac{\sin 67^\circ - \sin 43^\circ}{\sin 10^\circ}$ correct to 3 decimal places

Use your calculator to

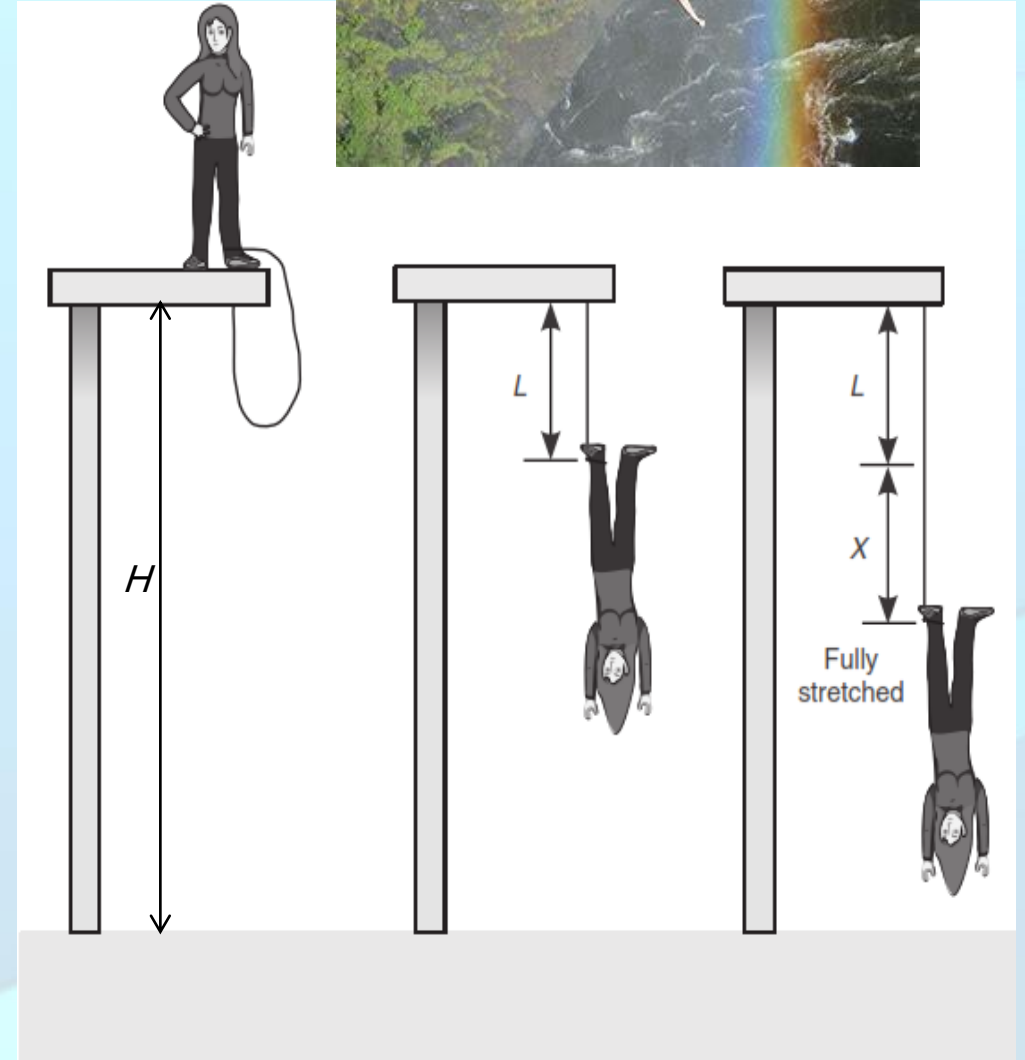
1. Evaluate $2.7(\pi - 1)$ correct to 3 significant figures
2. Evaluate $\pi^2(\sqrt{13} - 1)$ correct to 4 significant figures
3. Evaluate $3e^{(2\pi-1)}$ correct to 3 significant figures
4. Evaluate $\sqrt{\left[\frac{5.52\pi}{2e^{-2} \times \sqrt{26.73}}\right]}$ correct to 4 significant figures

Bungee Jumping Design.

As displayed in the figure. At full stretch, the elastic rope of original length L stretches to $L + X$. For a person whose weight is W [N] and a cord with a stiffness K [N/m], the extension X [m] is given by the following formula:

$$X = \frac{W}{K} + \sqrt{\frac{W^2}{K^2} + \frac{2WL}{K}}$$

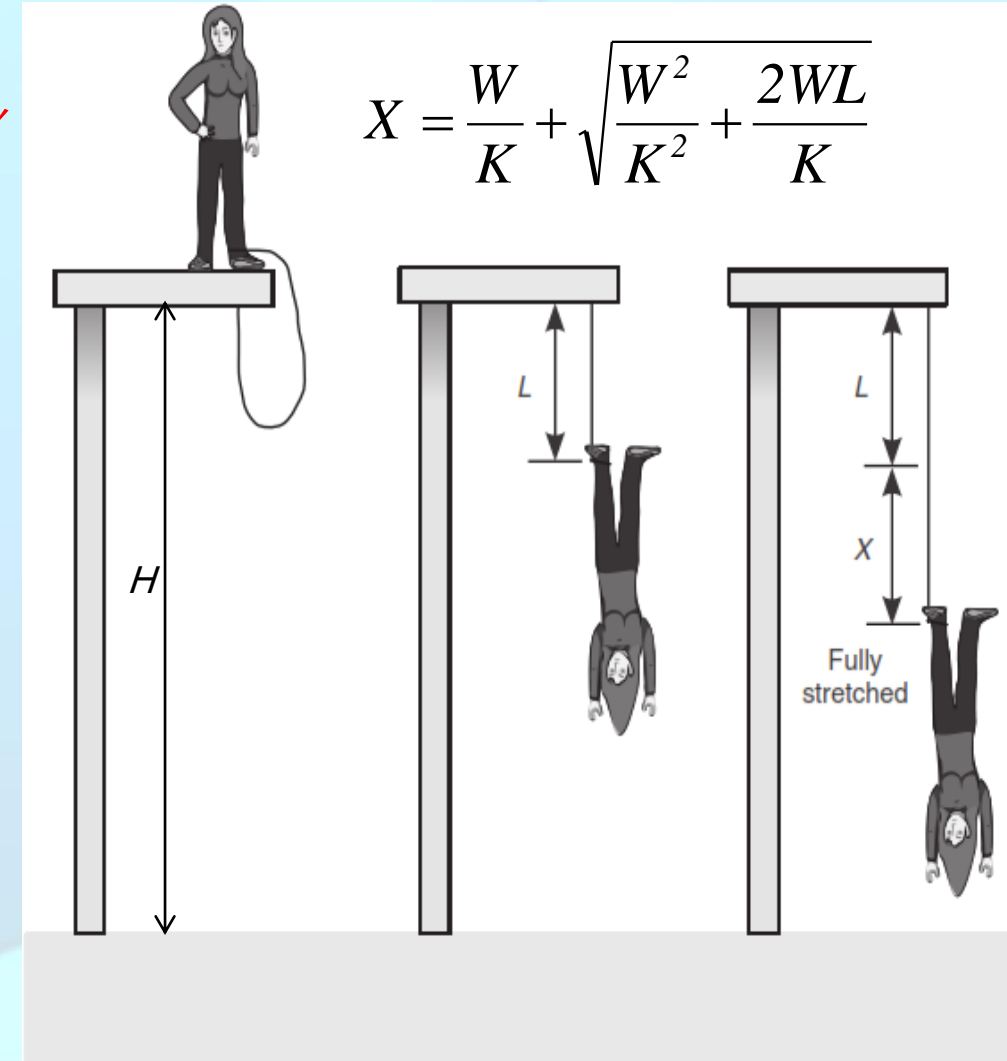
1. If the height of the tower H is 50 m, $K = 100$ N/m, $L = 15$ m, and the person's weight W is 700 N, will the person be able to bungee jump safely? Support your answer by giving the final value for $L + X$.
2. What's the jumper's weight limit?



3. If the height of the tower is 60 m, and the weight of the person is 800 N, and the unstretched length $L = 20$ m, find a value of K that enables this person to stop exactly 2 m above the ground.

4. Determine the height of the tower H , if $K = 80$ N/m, $L = 22$ m, and the person's weight W is 1000 N, and if the person must stop exactly 3m above the ground

5. Determine L the length of the rope, if $K = 80$ N/m, $H = 64$ m, and the person's weight W is 1000 N, and if the person must stop exactly 3m above the ground.



الأبجدية الإغريقية

اللفظ العربي	اللفظ الانكليزي	اغريقي كبير	اغريقي صغير	اللفظ العربي	اللفظ الانكليزي	اغريقي كبير	اغريقي صغير
نيو	Nu	N	ν	ألفا	Alpha	A	α
كُساي	Xi	Ξ	ξ	بيتا	Beta	B	β
أوميكرون	Omicron	O	ο	غَمَّا	Gamma	Γ	γ
پاي	Pi	Π	π	دِلتا	Delta	Δ	δ
رُو	Rho	Ρ	ρ	إِبِسِلون	Epsilon	E	ε
سِغما	Sigma	Σ	σ	زِيتا	Zeta	Z	ζ
تاو	Tau	T	τ	إِيتا	Eta	H	η
يُوبِسِلون	Upsilon	Υ	υ	ثِيتا	Theta	Θ	θ
فاي	Phi	Φ	φ	أَيوتا	Iota	I	ι
كاي	Chi	Χ	χ	كَبَّا	Kappa	K	κ
پِساى	Psi	Ψ	ψ	لَمّدا	Lambda	Λ	λ
أوميغا	Omega	Ω	ω	ميو	Mu	M	μ