

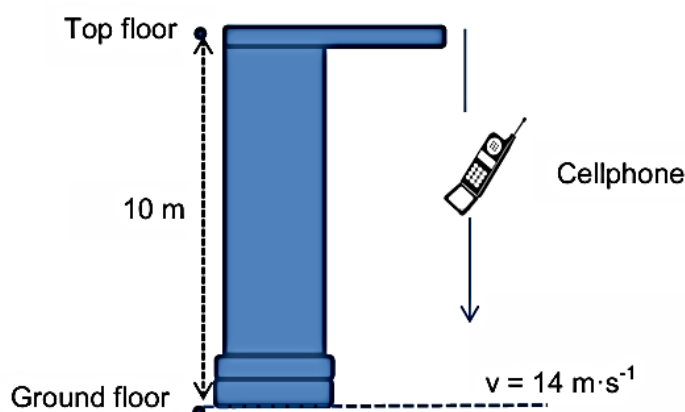
Energy: Exam Revision Tracker

Attempt #1		Attempt #2		Attempt #3		Attempt #4		Attempt #5	
Total	Score	Total	Score	Total	Score	Total	Score	Total	Score
14		16		13		12		15	
Percentage =		Percentage =		Percentage =		Percentage =		Percentage =	

Energy: Attempt #1

Total = 14 Marks

A woman is at the shopping mall 10 m above the ground. Her cellphone, with a mass of 0,01 kg, falls and hits the ground at a speed of $14 \text{ m}\cdot\text{s}^{-1}$. Ignore the effects of air resistance.



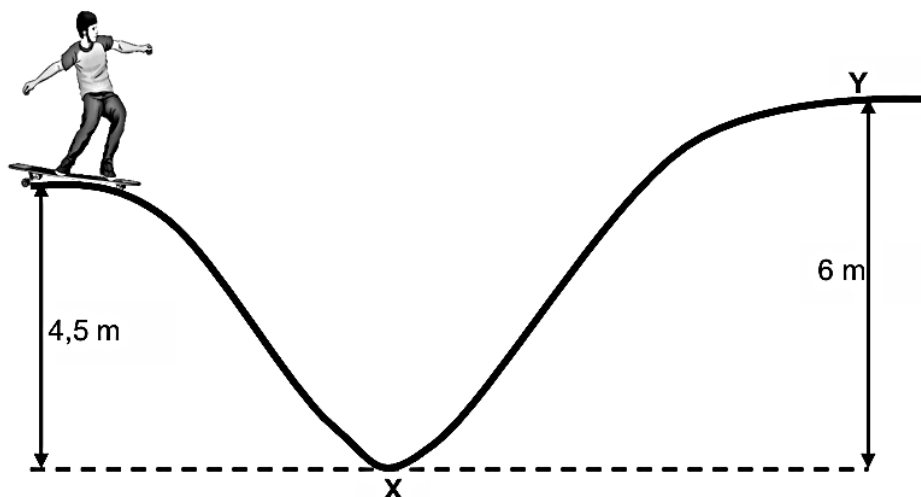
1. Convert $14 \text{ m}\cdot\text{s}^{-1}$ to $\text{km}\cdot\text{h}^{-1}$. (2)
2. Define the term *kinetic energy*. (2)
3. Calculate the gravitational potential energy of the cellphone at a height of 5 m above the ground. (3)
4. Calculate the velocity of the cellphone at a height of 5 m above the ground. (4)
5. Will the value of the cellphone's mechanical energy just before it hits the ground be GREATER THAN, LESS THAN or EQUAL TO the mechanical energy at a height of 5 m? Explain the answer. (3)

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Energy: Attempt #2 ⚡

Total = 16 Marks

A skateboarder, starting from the top of a ramp 4,5 m above the ground, skates down the ramp, as shown in the diagram below. The mass of the skateboarder and his board is 65 kg. Ignore the effects of friction.



1. Define the term *gravitational potential energy* in words. (2)
2. Calculate the gravitational potential energy of the skater just before he skates down the ramp. (3)
3. State the *principle of conservation of mechanical energy* in words. (2)
4. Use the principle stated in QUESTION 5.3 to calculate the magnitude of the velocity of the skateboarder when he reaches the ground at point X. (4)
5. Will the skateboarder be able to reach point Y if he were to remain on his skateboard? Write YES or NO and support the answer with a relevant calculation. (5)

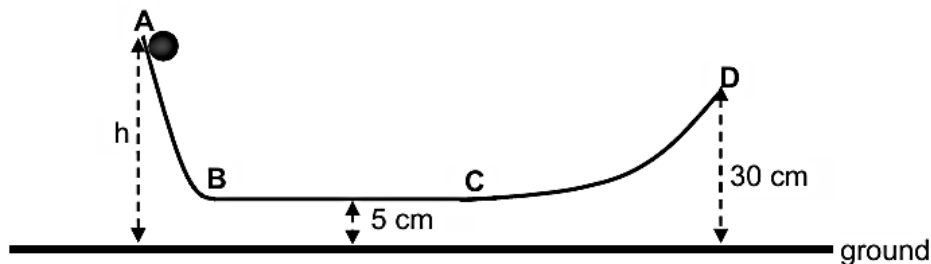
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Energy: Attempt #3 ⚡

Total = 13 Marks

A 2 kg ball rolls from rest from point **A** on a frictionless track **ABCD**, as shown below. The horizontal section, **BC**, of the track is 5 cm above the ground. The ball reaches point **D**, 30 cm above the ground, at a speed of $1,71 \text{ m}\cdot\text{s}^{-1}$.



1. Write down ONE term for the following statement:
The sum of gravitational potential energy and kinetic energy (1)
2. Calculate the:
 - 2.1 Mechanical energy of the ball at point **D** (4)
 - 2.2 Initial height **h** of the ball at point **A** (3)
 - 2.3 Speed of the ball while it moves between point **B** and point **C** (3)
3. The 2 kg ball is now replaced with a 4 kg ball.
How will the speed of the 4 kg ball compare to the speed of the 2 kg ball at point **D**? Choose from GREATER THAN, SMALLER THAN or EQUAL TO. Give a reason for the answer. (2)

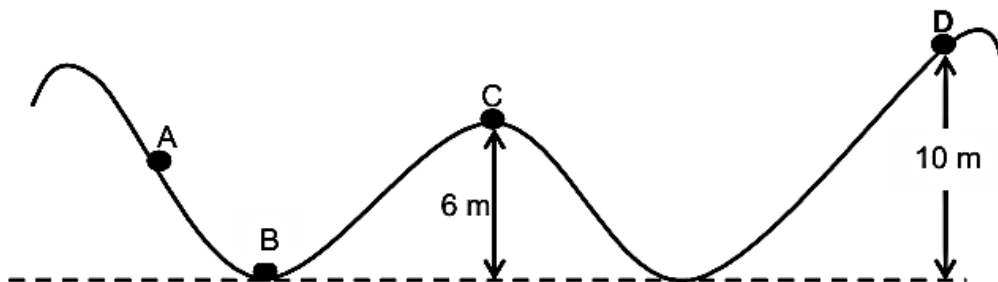


Energy: Attempt #4 ⚡

Total = 12 Marks

A steel ball of mass 5 kg is rolling over a frictionless surface, as shown below. When the ball reaches point **A** it has mechanical energy of 490 J.

Point **B** is on the ground.



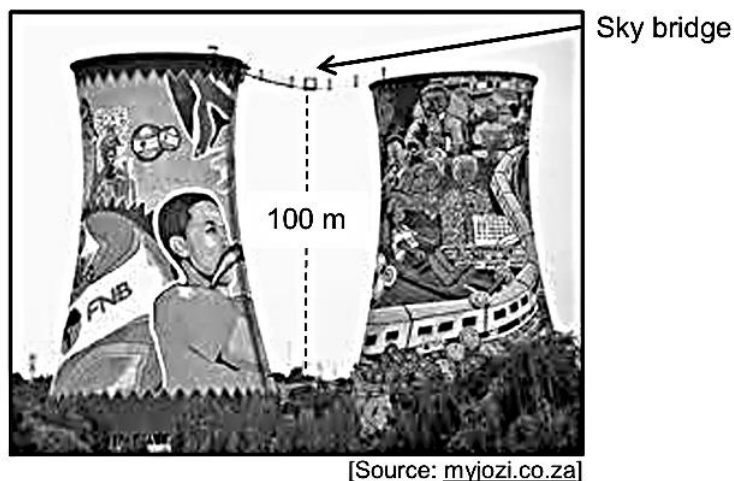
1. State the principle of conservation of mechanical energy in words. (2)
2. Use your knowledge of the principle of conservation of mechanical energy to write down the value of the:
 - 2.1 Gravitational potential energy of the ball at point **B**. (1)
 - 2.2 Total mechanical energy at point **C**. (1)
3. Calculate the gravitational potential energy of the ball at point **C**. (3)
4. Determine by calculation whether the ball will reach point **D**. (5)

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Energy: Attempt #5 ⚡

Total = 15 Marks

A lift takes a man to a sky bridge, which is 100 m above the ground, as shown below. He makes a bungee jump from the sky bridge. Ignore the effects of air resistance.



1. Define the term *kinetic energy*. (2)
2. The man and his gear have a mass of 72 kg. Calculate the gravitational potential energy of the man just before he jumps from the sky bridge. (3)
3. State the *law of conservation of mechanical energy*. (2)
4. Use the law in QUESTION 5.3 to calculate the velocity of the man at a height of 50 m above the ground. (5)
5. Draw a graph of E_p versus E_k for the motion of the man from the instant he jumps until he reaches the ground. (3)

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