Energy of a Pendulum

Activity 1 KE, PE, and TME Question Group 1 Question 1

A pendulum is swinging back and forth along its circular arc. Five locations along its path are shown. What changes would be observed as the pendulum swings from locations **A to B to C**?

The kinetic energy would ...

a. increase b. decrease d. first decrease and then increase

The potential energy would ...

a. increase b. decrease d. first decrease and then increase

The total mechanical energy would ...

a. increase b. decrease d. first decrease and then increase



- c. first increase and then decrease
- e. remains unchanged
- c. first increase and then decrease
- e. remains unchanged
- c. first increase and then decrease
- e. remains unchanged

Question 2

A pendulum is swinging back and forth along its circular arc. Five locations along its path are shown. What changes would be observed as the pendulum swings from locations **E to D to C**?

The kinetic energy would ...

a. increase b. decrease d. first decrease and then increase

The potential energy would ...

- a. increase b. decrease
- d. first decrease and then increase

The total mechanical energy would ...

- a. increase b. decrease
- d. first decrease and then increase



- c. first increase and then decrease
- e. remains unchanged
- c. first increase and then decrease
- e. remains unchanged
- c. first increase and then decrease
- e. remains unchanged

Question Group 2 Question 3

A pendulum is swinging back and forth along its circular arc. Five locations along its path are shown. What changes would be observed as the pendulum swings from locations **C to D to E**?

The kinetic energy would ...

a. increase b. decrease d. first decrease and then increase

The **potential energy** would ...

a. increase b. decrease d. first decrease and then increase

The total mechanical energy would ...

a. increase b. decrease d. first decrease and then increase

- A B C D
- c. first increase and then decrease
- e. remains unchanged
- c. first increase and then decrease
- e. remains unchanged
- c. first increase and then decrease
- e. remains unchanged

Question 4

A pendulum is swinging back and forth along its circular arc. Five locations along its path are shown. What changes would be observed as the pendulum swings from locations **C to B to A**?

The kinetic energy would ...

a. increase b. decrease d. first decrease and then increase

The **potential energy** would ...

a. increase b. decrease d. first decrease and then increase

The total mechanical energy would ...

- a. increase b. decrease
- d. first decrease and then increase



- c. first increase and then decrease
- e. remains unchanged
- c. first increase and then decrease
- e. remains unchanged
- c. first increase and then decrease
- e. remains unchanged

Question Group 3 Question 5

A pendulum is swinging back and forth along its circular arc. Five locations along its path are shown. What changes would be observed as the pendulum swings from locations **B to C to D**?

The kinetic energy would ...

- a. increase b. decrease d. first decrease and then increase
- a. Inst decrease and then increase

The potential energy would ...

a. increaseb. decreased. first decrease and then increase

The total mechanical energy would ...

a. increase b. decrease d. first decrease and then increase

c. first increase and then decrease

c. first increase and then decrease

c. first increase and then decrease

e. remains unchanged

e. remains unchanged

e. remains unchanged

Question 6

A pendulum is swinging back and forth along its circular arc. Five locations along its path are shown. What changes would be observed as the pendulum swings from locations **D** to **C** to **B**?

The kinetic energy would ...

a. increaseb. decreaseincrease and then decreased. first decrease and then increase

The potential energy would ...

a.	increase	b. decr	ease
d.	first decrease	and then ir	ncrease

The total mechanical energy would ...

- a. increase b. decrease
- d. first decrease and then increase



e. remains unchanged

c. first

- c. first increase and then decrease
- e. remains unchanged
- c. first increase and then decrease
- e. remains unchanged



Activity 2 Energy Bar Charts Question Group 4 Question 7

A pendulum is swinging back and forth along its circular arc. Consider locations A, B and C as shown. Match each location to the corresponding energy bar chart.





Question 8

A pendulum is swinging back and forth along its circular arc. Consider locations A, B and C as shown. Match each location to the corresponding energy bar chart.









A pendulum is swinging back and forth along its circular arc. Consider locations A, B and C as shown. Match each location to the corresponding energy bar chart.





Question 10

A pendulum is swinging back and forth along its circular arc. Consider locations A, B and C as shown. Match each location to the corresponding energy bar chart.









Question Group 5 Question 11

A pendulum is swinging back and forth along its circular arc. Consider locations A, B and C as shown. Match each location to the corresponding energy bar chart.





Question 12

A pendulum is swinging back and forth along its circular arc. Consider locations A, B and C as shown. Match each location to the corresponding energy bar chart.





A pendulum is swinging back and forth along its circular arc. Consider locations A, B and C as shown. Match each location to the corresponding energy bar chart.







Question 14

A pendulum is swinging back and forth along its circular arc. Consider locations A, B and C as shown. Match each location to the corresponding energy bar chart.









Question Group 6 Question 15

A pendulum is swinging back and forth along its circular arc. Consider locations A, B and C as shown. Match each location to the corresponding energy bar chart.





Question 16

A pendulum is swinging back and forth along its circular arc. Consider locations A, B and C as shown. Match each location to the corresponding energy bar chart.









A pendulum is swinging back and forth along its circular arc. Consider locations A, B and C as shown. Match each location to the corresponding energy bar chart.





Question 18

A pendulum is swinging back and forth along its circular arc. Consider locations A, B and C as shown. Match each location to the corresponding energy bar chart.









Activity 3 Do It With Numbers Question Group 7 Question 19

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 20 J and the kinetic energy (KE) is 0 J. Determine the PE and KE values at location B.



PE = 20 J	PE = 20 J	PE = 0 J
KE = 5 J	KE = 20 J	KE = 20 J

Question 20

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 15 J and the kinetic energy (KE) is 0 J. Determine the PE and KE values at location B.



PE = 15 J	PE = 0 J	PE = 15 J
KE = 15 J	KE = 15 J	KE = 5 J

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 25 J and the kinetic energy (KE) is 0 J. Determine the PE and KE values at location B.



PE = 0 J	PE = 25 J	PE = 5 J
KE = 25 J	KE = 25 J	KE = 25 J

Question 22

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 20 J and the kinetic energy (KE) is 0 J. Determine the PE and KE values at location B.



PE = 5 J	PE = 20 J	PE = 5 J
KE = 20 J	KE = 20 J	KE = 20 J

Question Group 8 Question 23

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 0 J and the kinetic energy (KE) is 20 J. Determine the PE and KE values at location B.



PE = 12 J	PE = 20 J	PE = 3 J
KE = 8 J	KE = -20 J	KE = 20 J

Question 24

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 0 J and the kinetic energy (KE) is 25 J. Determine the PE and KE values at location B.



PE = 25 J	PE = 3 J	PE = 15 J
KE = -25 J	KE = 25 J	KE = 10 J

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 0 J and the kinetic energy (KE) is 15 J. Determine the PE and KE values at location B.



PE = 3 J	PE = 9 J	PE = 25 J
KE = 15 J	KE = 6 J	KE = -25 J

Question 26

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 0 J and the kinetic energy (KE) is 20 J. Determine the PE and KE values at location B.



PE = 12 J	PE = 20 J	PE = 3 J
KE = 8 J	KE = -20 J	KE = 20 J

Question Group 9 Question 27

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 15 J and the kinetic energy (KE) is 0 J. Determine the PE and KE values at location B.



Question 28

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 20 J and the kinetic energy (KE) is 0 J. Determine the PE and KE values at location B.



PE = 8 J	PE = 0 J	PE = 17 J
KE = 12 J	KE = 20 J	KE = 20 J

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 25 J and the kinetic energy (KE) is 0 J. Determine the PE and KE values at location B.





Question 30

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 15 J and the kinetic energy (KE) is 0 J. Determine the PE and KE values at location B.



PE = 0 J	PE = 9 J	PE = 3 J
KE = 15 J	KE = 6 J	KE = 15 J

Question Group 10 Question 31

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 16 J and the kinetic energy (KE) is 4 J. Determine the PE and KE values at location B.



Question 32

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 20 J and the kinetic energy (KE) is 5 J. Determine the PE and KE values at location B.



PE = 10 J	PE = -10 J	PE = 5 J
KE = 15 J	KE = 10 J	KE = 20 J

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 12 J and the kinetic energy (KE) is 3 J. Determine the PE and KE values at location B.





Question 34

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 16 J and the kinetic energy (KE) is 4 J. Determine the PE and KE values at location B.



PE = 4 J	PE = 8 J	PE = -8 J	
KE = 16 J	KE = 12 J	KE = 8 J	

Question Group 11 Question 35

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 3 J and the kinetic energy (KE) is 12 J. Determine the PE and KE values at location B.



PE = 12 J	PE = 9 J	PE = 21 J	
KE = 3 J	KE = 9 J	KE = 12 J	

Question 36

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 4 J and the kinetic energy (KE) is 16 J. Determine the PE and KE values at location B.



PE = 12 J	PE = 16 J	PE = 16 J
KE = 12 J	KE = 28 J	KE = 4 J

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 5 J and the kinetic energy (KE) is 20 J. Determine the PE and KE values at location B.





Question 38

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 3 J and the kinetic energy (KE) is 12 J. Determine the PE and KE values at location B.



PE = 12 J	PE = 12 J	PE = 9 J	
KE = 3 J	KE = 21 J	KE = 9 J	

Question Group 12 Question 39

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 5 J and the kinetic energy (KE) is 20 J. Determine the PE and KE values at location B.



PE = 25 J	PE = 5 J	PE = 25 J	
KE = 5 J	KE = 0 J	KE = 0 J	

Question 40

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 4 J and the kinetic energy (KE) is 16 J. Determine the PE and KE values at location B.



PE = 16 J	PE = 20 J	PE = 20 J	
KE = 0 J	KE = 0 J	KE = 4 J	

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 3 J and the kinetic energy (KE) is 12 J. Determine the PE and KE values at location B.





Question 42

A pendulum is swinging back and forth along its circular arc as shown. At location A, the potential energy (PE) is 5 J and the kinetic energy (KE) is 20 J. Determine the PE and KE values at location B.



PE = 25 J	PE = 20 J	PE = 25 J
KE = 5 J	KE = 0 J	KE = 0 J