## تم تحميل هذا الملف من موقع المناهج الإماراتية

## حل نماذج امتحانية سابقة منهج انسباير

موقع المناهج ⇦ المناهج الإماراتية ⇦ الصف التاسع المتقدم ⇦ فيزياء ⇦ الفصل الثالث ⇦ الملف

تاريخ إضافة الملف على موقع المناهج: 2024-05-27 09:39:08

إعداد: Cyclewala Portia

## التواصل الاجتماعي بحسب الصف التاسع المتقدم

اضغط هنا للحصول على جميع روابط "الصف التاسع المتقدم"

## روابط مواد الصف التاسع المتقدم على تلغرام

| التربية الاسلامية | اللغة العربية | اللغة الانجليزية | الرياضيات |
|---|---|---|---|

## المزيد من الملفات بحسب الصف التاسع المتقدم والمادة فيزياء في الفصل الثالث

| | |
|---|---|
| 1 | جميع قوانين المادة العلاقات والثوابت الرياضية |
| 2 | حل تجميعة أسئلة وفق الهيكل الوزاري منهج بريدج |
| 3 | تجميعة صفحات الكتاب وفق الهيكل الوزاري منهج انسباير |
| 4 | الهيكل الوزاري الجديد منهج بريدج المسار المتقدم |
| 5 | الهيكل الوزاري الجديد منهج انسباير المسار المتقدم |

Al Jahili School C2/3

School Operation Sector 2

Council 6 Cluster 6

# Grade 09 Advanced Physics
# Academic Year 2023/2024 – Term 3

**Exam Practice Guide**
**(2023 - 2024)**

**Cluster Principal: Laila Al hammadi**

**School Principal: Fatima Al Nasri**

**Vice Principal: Asma Al Ghaithi**

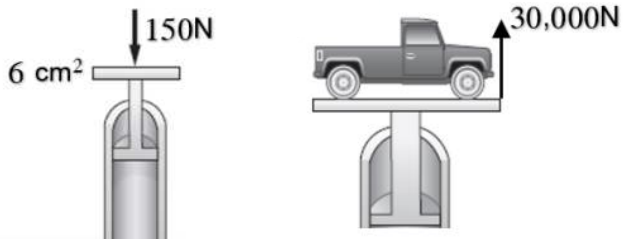
**Teacher: Portia Cyclewala**

**Student Name:**

_____

## 1. C9L3

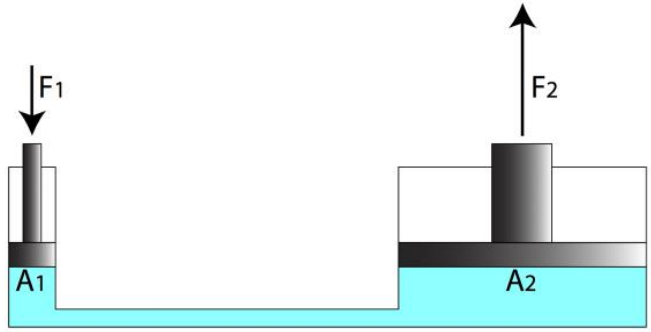
The diagram below shows a hydraulic lift, what is the area of the large piston?




- 1,200.0 cm² ✓
- 750,000.0 cm²
- 0.03 cm²
- 33.3 cm²

## 2. C9L3

In the hydraulic system shown in the figure below, the pressure on the small piston is **P1**, and the pressure on the large piston is **P2**. According to pascal's law, which of the following is **correct?**




- $P_1 = P_2$ ✓
- $P_1 < P_2$
- $F_1 = F_2$
- $A_1 > A_2$

3. **C8L2**

Given that

$$KE = \frac{1}{2} I\omega^2$$

What is $\omega$ equal to?

a. $\sqrt{\frac{2KE}{I}}$

c. $\sqrt{\frac{KE}{2I}}$

b. $\sqrt{\frac{I}{2KE}}$

d. $\frac{2KE}{I}$

4. **C8L3**

Which of the following statements correctly gives the law of conservation of energy?

a. Energy cannot be created nor destroyed, but it can be transformed from one form to another.

b. Energy can be created but not destroyed.

c. Energy cannot be created, destroyed, or transformed from one form to another.

d. Energy cannot be created, but it can be destroyed or transformed from one form to another.

5. **C8L1**

Which one of the following is not a unit of energy?

a. $Nm^2$

b. J

c. Nm

d. $Kgm^2/s^2$

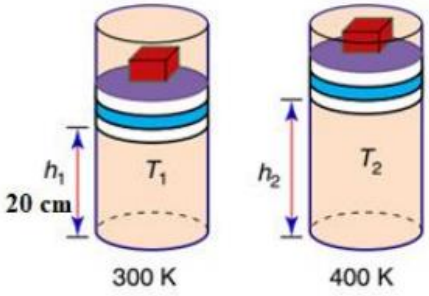
6.

**An amount of air is kept in a cylinder with a piston under constant pressure of (100kPa) as shown in the figure. The initial height of the piston is ($h_1$=20cm) from the base of the cylinder at (300°K).What is the final height of the piston if the temperature is increased to (400°K)?**

**( Volume of Cylinder=Base area x height)**

يتم تطبيق ضغط ثابت قدره (100 kPa)على كمية من الهواء داخل اسطوانة ذات مكبس. إذا كان الارتفاع الابتدائي للمكبس فوق قاعدة الاسطوانة ($h_1$=20 cm)عند درجة(300°K)، ما هو الارتفاع النهائي للمكبس إذا ارتفعت درجة الحرارة إلى (400°K)؟

(حجم الاسطوانة= مساحة القاعدة x الارتفاع)

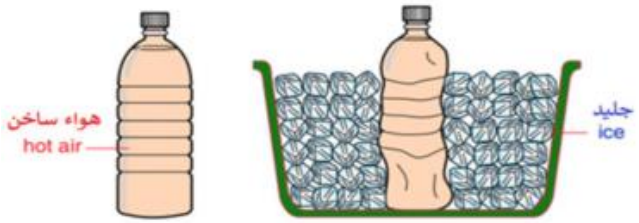



- 26.7cm
- 15.0 cm
- 6.70 cm
- 60.0 cm

7.

**A plastic bottle initially containing hot air is placed into a bowl of ice as shown in the figure. Which of the following statements is true?**

زجاجة بلاستيكية تحتوي على هواء ساخن في البداية، ثم تم وضعها في حوض به جليد كما هو موضح في الشكل. أي من العبارات التالية صحيحة؟

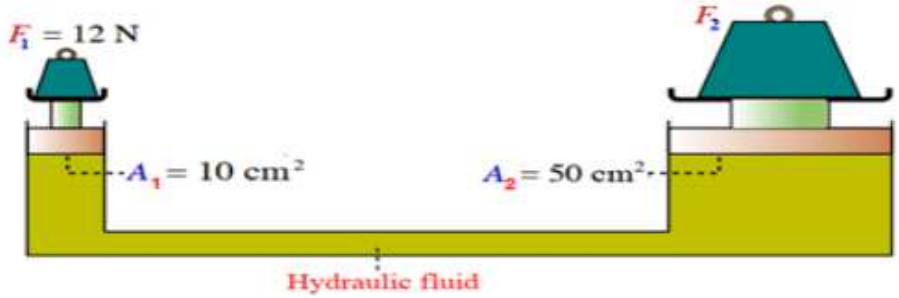



- The average kinetic energy of air particles decreases معدل الطاقة الحركية لجزئيات الهواء داخل الزجاجة يقل عما كان عليه
- The average kinetic energy of air particles increases معدل الطاقة الحركية لجزئيات الهواء داخل الزجاجة يزداد عما كان عليه
- The average kinetic energy of ice particles decreases معدل الطاقة الحركية لجزئيات الجليد يقل عما كان عليه
- The average kinetic energy of ice particles and air particles in the bottle remain the same لا يتغير معدل الطاقة الحركية لجزئيات الجليد وجزيئات الهواء داخل الزجاجة

8. **C9L3**

**The figure shows a hydraulic system. If a force of (12N) is exerted on the small piston, what is the output force on the large piston ($F_2$)?**

يُظهر الشكل المجاور نظامًا هيدروليكيًا. إذا أثرت قوة مقدارها(12N)على المكبس الصغير، فما مقدار القوة المؤثرة على المكبس الكبير($F_2$)؟




- 60.0 N
- 24.0 N
- 120 N
- 2.8N

9. **C9L1**

**The figure below shows a student's thump pressing a drawing pin with a force of (15N) into a piece of wood. The cross-sectional area of the tip of the pin is (0.01cm²). What is the pressure of the tip of the drawing pin on the wood?**

يوضح الشكل أدناه أصبع الإبهام لطالب يضغط على دبوس بقوة (15N) على قطعة من الخشب. تبلغ مساحة المقطع العرضي لرأس الدبوس (0.01cm²)، ما مقدار الضغط الذي يسلطه رأس الدبوس على قطعة الخشب؟

- $1.1.5 \times 10^{7}$ Pa
- $1.1.5 \times 10^{3}$ Pa
- $1.6.7 \times 10^{4}$ Pa
- $1.6.7 \times 10^{8}$ Pa

10. **C8L1**

An electric motor lifts a box of weight 600 N straight up through a vertical distance of 15.0 m in a time of 20.0 s. What power does the electric motor produce? (Assume the electric motor is 100 % efficient)

a. 450 W

b. 800 W

c. 180 kW

d. 2.00 W

11. **C8L1**

A motorcycle of mass 400 kg speeds up from 10 m/s to 20 m/s. How much work is done on the motorcycle to increase its speed?

a. $6.00 \times 10^4$ J

b. $1.20 \times 10^5$ J

c. $8.00 \times 10^4$ J

d. $2.00 \times 10^4$ J

12. **C8L2**

A basketball player spins a basketball on his finger at 3 rad/s, as shown below.

If he then spins the basketball at 6 rad/s, the rotational kinetic energy of the basketball will _____

a. increase by a factor of 4.

b. increase by a factor of 2.

c. decrease by a factor of 4.

d. decrease by a factor of 2.

13. **C8L3**

The diagram below indicates the instantaneous positions of a simple pendulum in simple harmonic motion.

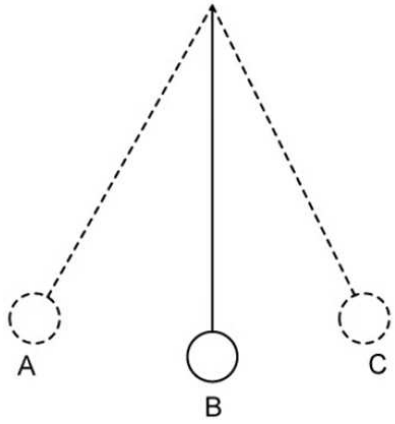
At which position(s) is the potential energy of the system maximum?

a. A and C only

b. B only

c. A and B only

d. B and C only



14. **C8L1**

The force - displacement graph below represents the force applied when moving a block through a displacement of 2.4 m.

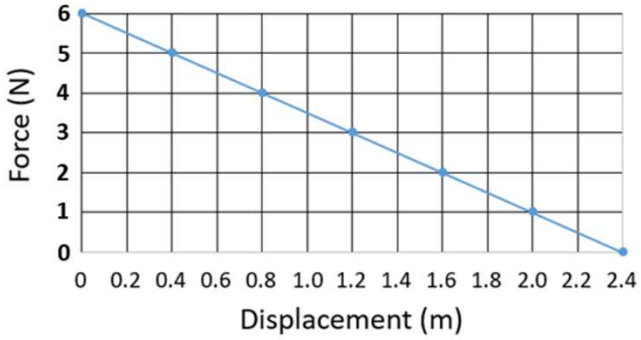
What is the work done on the block by the force?

a. 7.20 J

b. 14.4 J

c. 2.50 J

d. 0.400 J




15. **C8L2**

Noor lifts a 2.5 kg book from her desk, which is 0.70 m above the floor, to a bookshelf that is 1.80 m above the floor.

What is the change in gravitational potential energy of the book-earth system? (Use $g$ = 10 N/kg)

a. 27.5 J

b. 17.5 J

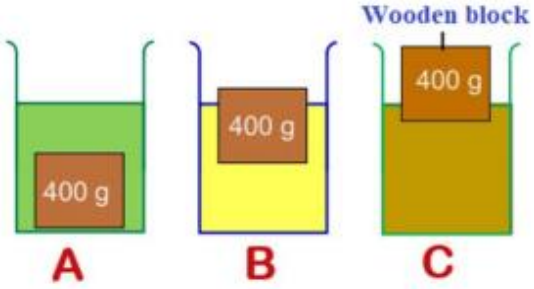
c. 45.5 J

d. 62.5 J

16. **C9L3**

The figure shows the same wooden block submerged in three different liquids A, B, and C. Which of the following statements is correct about the densities of these liquids(ρA, ρB, ρC)?

يُوضح الشكل أدناه المكعب الخشبي نفسه عند غمره في ثلاث سوائل مختلفة A و Bو C
أي من العبارات التالية صحيحة حول كثافات تلك السوائل ( .
( ρA, ρB, ρC)؟




$\rho_A < \rho_B < \rho_C$

$\rho_A > \rho_B > \rho_C$

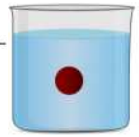
$\rho_A < \rho_B = \rho_C$

$\rho_A > \rho_B = \rho_C$

17. **C9L3**

When a ball with a mass of (0.25kg) was submerged in a cup of water, it remained in the middle of the cup as shown in the figure. What is the volume of the ball?
**(Density of water $\rho = 10^3$ kg m$^{-3}$ )**

عندما غُمرت كرة كتلتها (0.25 kg) داخل كوب من الماء استقرت في وسط الكوب كما هو مبين في الشكل. ما هو حجم الكرة؟



2.50x10$^{-4}$ m3

2.50x10$^{2}$ m3

2.45 m3

2.55 x10$^{-5}$ m3

18. **C9L1**

How much pressure is exerted by a force of **600 N** spread vertically over a **20 m²** area?

**300 Pa**

**2700 Pa**

**30 Pa**

**12000 Pa**

$P = \frac{F}{A}$

$F_{buo.} = \rho_{fluid} V g$

$F_2 = F_1 \frac{A_2}{A_1}$

$P = \rho h g$

$PV = nRT$

_____

_____

19. **C9L1**

Which of the following is **not correct unit** of pressure?

**kPa**

**N/m²**

**N/m**

**Pa**

20. **C9L3**

Which principle explains why an object seems to weigh less when submerged in water?

Archimedes' principle

Bernoulli's principle

Boyle's Law

Pascal's principle

21. **C7L1**

Kepler's third law states that ……

a. the orbits of the planets are elliptical.

b. the speed of a planet's orbit varies depending on which part of the ellipse it is occupying.

c. the square of the ratio of the periods of any two planets revolving around the Sun is equal to the cube of the ratio of their average distance from the sun.

d. objects attract other objects with a force that is directly proportional to the product of their masses, and inversely proportional to the square of the distance between them.

22. **C9L3**

A hydraulic piston is used to lift **1030 N** using **45 N** of force. If the platform supporting the weight has an area of **1.2 m²**, what is the area of the piston that force is applied to?

**19.1 m²**

**27.5 m²**

**0.036 m²**

**0.052 m²**

$$P = \frac{F}{A}$$

$$F_{buo.} = \rho_{fluid} V g$$

$$F_2 = F_1 \frac{A_2}{A_1}$$

$$P = \rho h g$$

$$PV = nR T$$

23. **C9L3**

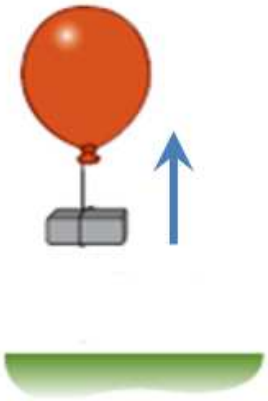
In the **figure** a helium balloon rises because of the buoyant force of the air lifting it. If the volume of the helium balloon is **0.91 m³**, the density of helium is **0.18 kg/m³**, and the density of air is **1.3 kg/m³**, what is the buoyant force on the helium balloon?

**11.6 N**

**16 N**

**116 N**

**1.6 N**



$$P = \frac{F}{A}$$

$$F_{buo.} = \rho_{fluid} V g$$

$$F_2 = F_1 \frac{A_2}{A_1}$$

$$P = \rho h g$$

$$PV = nR T$$

$$g = 9.81\ m/s^2$$

24. **C8L1**

A ball of mass 4 kg is dropped from the top of a tall building. If the ball falls through a vertical distance of 50 m, what is the work done by gravity on the ball? (Use $g$ = 10 N/kg)

a. + 2000 J

b. - 2000 J

c. + 200.0 J

d. - 200.0 J

25. **C9L3**

The pressure exerted by a column of fluid on a body is given by equation:

$$P = \rho g X$$

What does the symbol **X** represent in the equation?

the volume of the fluid.

the height of the column of fluid.

the weight of the fluid.

the density of the fluid.

26. **C9L3**

The pressure exerted by a column of fluid on a body is given by equation:

$$P = X g h$$

What does the symbol **X** represent in the equation?

the volume of the fluid.

the height of the column of fluid.

the weight of the fluid.

the density of the fluid.

27. **C9L3**

What is the net force on a rock submerged in water if the rock weighs **45 N** in air and has a volume of $(2.1\times 10^{-3}\ m^3)$?

| | |
|---|---|
| $F_2 = F_1\frac{A_2}{A_1}$ | $P = \frac{F}{A}$ |
| $P = \rho\, h\, g$ | $F_{buo.} = \rho_{fluid} V\, g$ |
| $PV = nR\,T$ | $g = 9.81\ m/s^2$ |
| | $\rho_{water} = 1.0\times 10^3 kg/m^3$ |

**24 N**

**45 N**

**54 N**

**2.4 N**

28. **C8L1**

Ahmed uses a rope to drag a wooden crate of mass 20 kg a distance of 15.0 m across a frictionless floor. The rope makes an angle of 40° with the horizontal. If Ahmed pulls the rope with a force of 150 N, how much work does the rope do on the crate?

a. 1.72 kJ

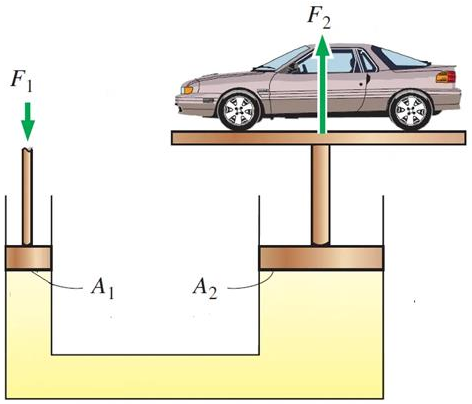
b. 1.45 kJ

c. 2.25 kJ

d. 3.00 kJ

29. **C9L3**

**A worker exerts a force F1on a ($0.05m^2$) hydraulic piston to lift an automobile of weight of (9000N) . The piston that the automobile sits on has an area of ($5.0m^2$). What is force F1 exerted by the worker?**




**90 N**

**100 N**

**450 N**

**9000 N**

States of Matter

$$P = \frac{F}{A}$$

$$\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$$

$$\frac{V_1}{T_1} = \frac{V_2}{T_2}, P\ constant$$

$$PV = nRT$$

$$\frac{F_2}{A_2} = \frac{F_1}{A_1}$$

$$P = \rho hg$$

$$F_{buoyant} = (F_{bottom} - F_{top})$$

$$F_{buoyant} = \rho_{(fluid)}Vg$$

$$R = 8.31\ Pa.\frac{m^3}{mol.K}$$

30. **C7L1**

The Earth moving in an elliptical orbit moves …..

a. slower when it is closer to the Sun.

b. faster when it is farther away from the Sun.

c. at the same speed when it is farther away from the Sun.

d. faster when it is closer to the Sun.

31. **C7L1**

When decreasing the distance between two bodies, the gravitational force between them …….

a. increases.

b. decreases.

c. remains constant.

d. becomes zero.

32. **C7L1**

Which of the following is not a valid measuring unit of (G)

a. $Nm^2/kg^2$
b. $Nm^2kg^{-2}$
c. $Nkg^{-2}m^2$
d. $Nm^3/kg^3$

33. **C8L1**

The SI unit of work is called a **joule** (J). What does one joule is equal to?

1 N · m

1 N · $m^2$

1 N/m

1 N/$m^2$

34. **C9L3**

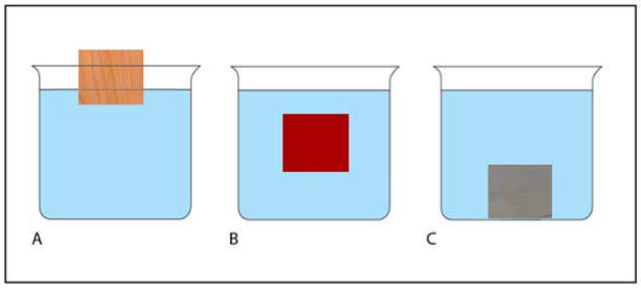
The figure shows three blocks submerged in three cups of water. In which cup the buoyant force equals the weight of the block?

B

A

C

A , C




35. **C8L1**

According to the Work – Energy Theorem, which of the following is not correct?

If the external world does work on a system, then W is positive, and the energy of the system increases.
إذا قام العالم الخارجي بشغل على النظام، فإن الشغل W يكون موجبا وتزداد طاقة النظام.

Work done on a system is equal to the change in the system's energy.
الشغل المبذول على نظام ما يساوي التغير في طاقة النظام

If the external world does work on a system, then W is negative, and the energy of the system decreases.
إذا قام العالم الخارجي بشغل على النظام، فإن الشغل W يكون سالبا وتتناقص طاقة النظام

If a system does work on the external world, then W is negative, and the energy of the system decrease
إذا قام النظام بشغل على المحيط الخارجي، فإن الشغل W يكون سالبا وتتناقص طاقة النظام.

36. **C8L1**

Two identical forklifts raise two loads with same masses a distance of 1 m. the blue forklift raises the load in 9 seconds, and the orange forklift raises the load in 5 seconds, which forklift develops more power?

رافعتان شوكيتان متماثلتان ترفعان حمولتين لهما نفس الكتلة لمسافة متر واحد. ترفع الرافعة الشوكية الزرقاء الحمولة في 9 ثوان بينما ترفع الرافعة الشوكية البرتقالية الحمولة في 5 ثوان، أي الرافعتين تحقق قدرة أكبر؟

A. Can't be determined without knowing the mass.

B. The orange forklift (Left).

C. The blue forklift (Right).

D. Both develops the same power.

37. **C8L2**

A ball is rolling initially with velocity (v), If the velocity is doubled to (2v), what change will occur on ball's kinetic energy (KE)?

$KE_2 = 2\ KE_1$

$KE_2 = 3\ KE_1$

$KE_2 = 4\ KE_1$

$KE_2 = KE_1$

_____

_____

_____

_____

_____

38. **C8L2**

Which of the following equations is used to calculate the rotational kinetic energy?

أي المعادلات التالية تستخدم لحساب طاقة الحركة الدورانية؟

$\frac{1}{2}I\omega^2$

$\frac{1}{2}mv^2$

$-mgh$

$mc^2$

39. **C8L3**

The law of conservation of mechanical energy states that "The sum of the system's kinetic energy and potential energy before an event is equal to the sum of the system's kinetic energy and potential energy after that event." Which equation best express this law?

ينص قانون حفظ الطاقة الميكانيكية على أن " مجموع طاقة الحركة وطاقة الوضع للنظام قبل الحدث مساويًا لمجموع طاقة الحركة وطاقة الوضع للنظام بعد هذا الحدث" أي المعادلات التالية تعبر عن هذا القانون؟

$KE_i + PE_i = KE_f + PE_f$

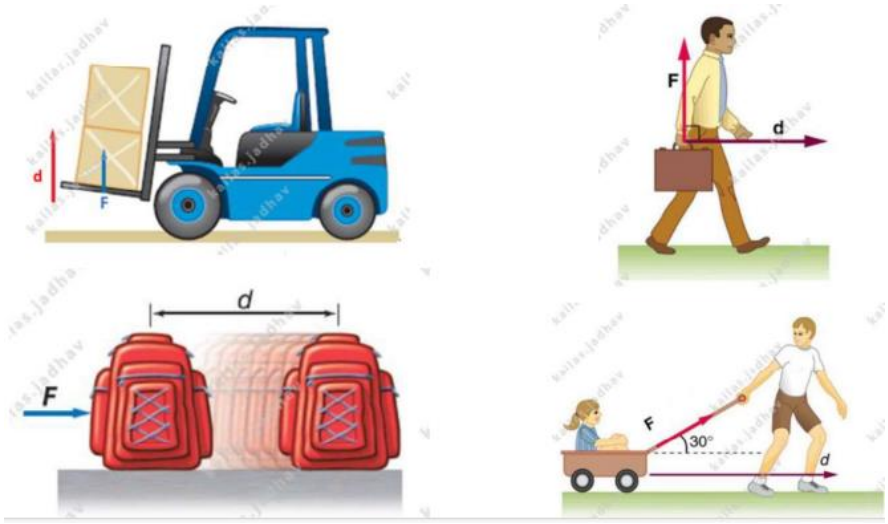
$KE_i + PE_f = KE_f + PE_i$

$KE_i - PE_i = KE_f - PE_f$

$KE_i + PE_i = 0$

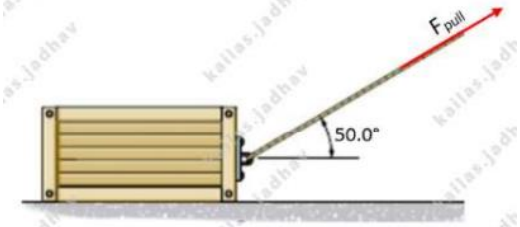
40. **C8L1**

In which of the following cases the work done quals zero?




41. **C8L1**

A rope is used to pull a metal box a distance of 20.0 m across the floor. The rope is held at an angle of 50.0° with the floor, and a force of 303 N is applied to the rope. How much work does the rope do on the box?




303000 J

3895 J

4642 J

6060 J

_____

_____

_____

_____

_____

_____

42. **C9L3**

A stone of volume (**0.5 $m^3$**) is submerged in water. The density of water (**$\rho_{water}$= 1000 $kg/m^3$**. )What is the buoyant force acting on the stone?

**4900 N**

**19600 N**

**51.00 N**

**204.0 N**

States of Matter

$$P = \frac{F}{A}$$

$$\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$$

$$\frac{V_1}{T_1} = \frac{V_2}{T_2}, P\ constant$$

$$PV = nRT$$

$$\frac{F_2}{A_2} = \frac{F_1}{A_1}$$

$$P = \rho hg$$

$$F_{buoyant} = (F_{bottom} - F_{top})$$

$$F_{buoyant} = \rho_{(fluid)}Vg$$

$$R = 8.31\ Pa.\frac{m^3}{mol.K}$$

43. **C9L3**

At what **depth** from the surface of a swimming pool the **pressure** of water is (**4900 Pa**)?

**0.50 m**

**2.00 m**

**4.90 m**

**5.00 m**

44. **C9L1**

A 0.95 kg physics book with dimensions of 0.26 m and 0.22 m is at rest on a table, what pressure is applied by the book on the table?

0.05 Pa

602 Pa

163 Pa

16.6 Pa

45. **C8L2**

A boy lifts a 2.50 kg book from his desk, which is 0.70 m high, to a bookshelf that is 2.40 m high. What is the potential energy of the book-Earth system relative to the desk when the book is on the shelf?

6.00 J

58.8 J

76.0 J

41.7 J

46. **C8L3**

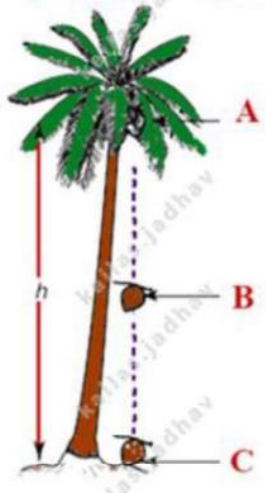
The figure shows a coconut of mass (m) falling from a height of (h) meters to the ground. Which equation is correct for the kinetic and potential energies of the coconut at points A, B, and C?

$PE_{(C)} > PE_{(B)} > PE_{(A)}$

$KE_{(A)} > PE_{(A)}$

$PE_{(C)} = KE_{(C)}$

$KE_{(C)} > KE_{(B)} > KE_{(A)}$




47. **C8L3**

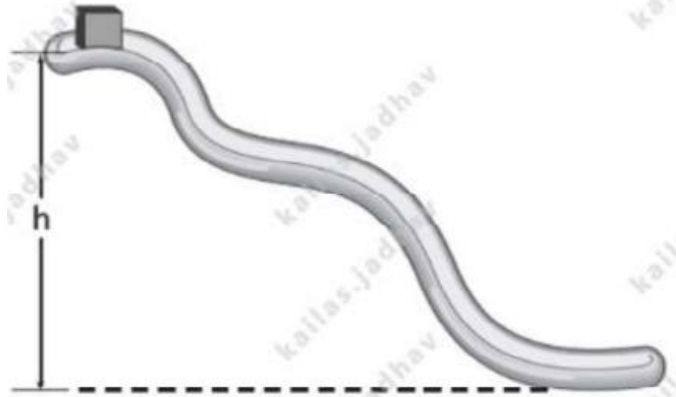
The illustration below shows a box on a curved, frictionless track. The box starts with zero velocity at the top of the track. It then slides from the top of the track to the horizontal part at the ground. Its velocity just when it reaches the ground is 15 m/s. What is the height (h) from the ground to the top of the track?

12.2 m

11.5 m

4.3 m

6.0 m



48. **C9L3**

**When an object is immersed in a fluid, the fluid exerts a buoyant force on the object. What is the buoyant force?**

1. **The upward force exerted by a fluid on the immersed object**
2. **The upward force exerted by the immersed object a on the fluid**
3. **The downward force exerted by the fluid on the immersed object**
4. **The downward force exerted by the immersed object the fluid**

49. **C7L1**

Which of the following is proportional to the square of the period of a planet orbiting the Sun?

أي مما يلي يتناسب طرديا مع مربع الزمن الدوري لكوكب يدور حول الشمس ؟

the product of the mass of the planet and the mass of the Sun
حاصل ضرب كتلة الكوكب وكتلة الشمس

the mass of the planet
كتلة الكوكب

the distance between the planet and the Sun cubed
مكعب المسافة بين الكوكب والشمس

the mass of the Sun
كتلة الشمس

50. **C7L1**

**Which of the following describes Kepler's Second law ?**

a. ○ The law of equal areas

b. ○ The law of orbits

c. ○ The law of Periods

d. ○ The Law of Gravitation

51. **C9L3**

**Which of the following states that "any change in pressure applied at any point on a confined fluid is transferred undiminished throughout the fluid"?**

1. **Pascal's principle**
2. **Archimedes' principle**
3. **Boyle's law**
4. **Charles's law**

52. **C7L2**

The mass of the Moon is $7.3\times10^{22}$ kg and its radius is 1785 km. What is the strength of the gravitational field on the surface of the Moon?

تساوي كتلة القمر $7.3\times10^{22}$ kg ونصف قطره 1785 km ، فما شدة مجال الجاذبية على سطحه؟

1.5 N/kg

9.8 N/kg

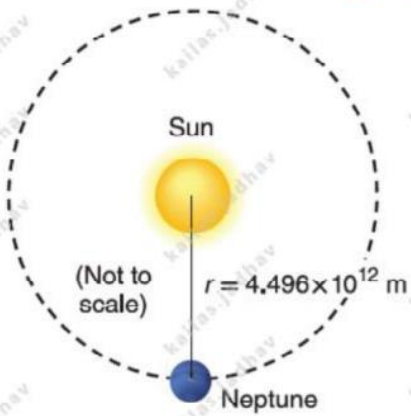
7.3 N/kg

6.5 N/kg

53. **C7L1**

Neptune orbits the Sun at an average distance given in the figure. If the mass of the Sun is $1.99\times10^{30}$ kg, what is the period of Neptune's orbit?

يدور نبتون حول الشمس، ويوضح الشكل متوسط المسافة بينهما. إذا كانت كتلة الشمس $1.99\times10^{30}$ kg فما الزمن الدوري لنبتون؟




$3.10\ x10^9$ s

$4.20\ x10^7$ s

$5.20\ x10^9$ s

$1.70\ x10^9$ s

54. **C8L1**

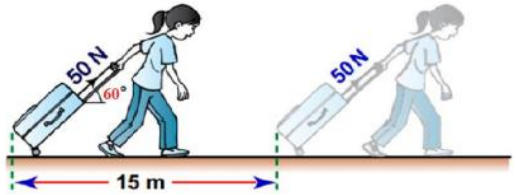
Salma pulls a suitcase with a force of (50 N), that is applied along the handle at an angle of (60º ) to the horizontal. How much work has Salma done after walking a distance of (15m), horizontally?

375 J

650 J

750 J

900 J




55. **C9L3**

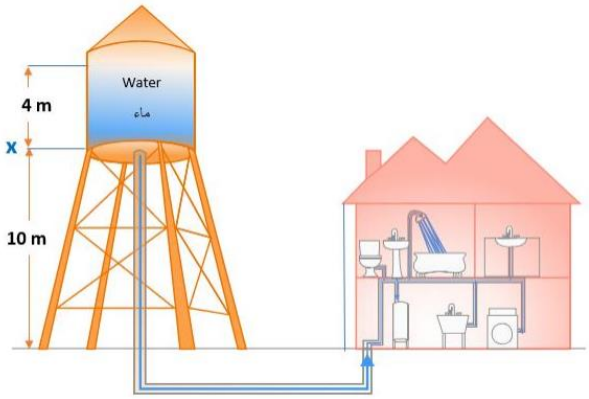
**The figure shows a tank that supplies water to a house. What is the water pressure at (X) at the bottom of the tank?**
**(Density of water ρ = $10^3$ kg $m^{-3}$ )**

$3.92 \times 10^4$ N.m –2

$1.37 \times 10^5$ N.m –2

$9.81 \times 10^4$ N.m –2

$5.89 \times 10^4$ N.m –2



56. **C8L1**

Which of the following equals energy divided by the time required to this change ?
أي من الآتي يساوي التغيير في الطاقة مقسوما على الزمن اللازم لحدوث التغير؟

- Power القدرة
- Kinetic energy الطاقة الحركية
- Efficiency الكفاءة
- Work الشغل

57. **C8L1**

A weightlifter lifts (300 kg), from the ground to a height of (2.0 m) in (3.0s). What is the average power generated by him?

- 1960 W
- 450 W
- 1800 W
- 200 W

58. **C8L2**

Which of the following examples shows kinetic energy?

أي من الأمثلة التالية يعبر عن الطاقة الحركية؟

- A river flowing down a hill
  نهر يتدفق إلى اسفل التل
- The battery of light flash
  بطارية ضوء الفلاش
- A golf ball placed at the edge of the hole
  كرة جولف موضوعة عند حافة الحفرة
- Energy stored in a bow and arrow
  الطاقة المختزنة في القوس والسهم

59. **C8L1**

Salem ties a ball to the end of a (1.0 m) string and swings the ball in a circle. If the string exerts a (10 N) force on the ball, how much work does the string do on the ball during a swing of one complete circle?

0.0J

10.0J

62.3J

31.1J

60. **C8L1**

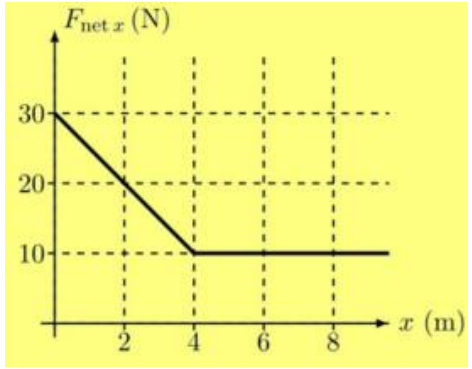
A particle experiences a force that varies with position as shown in the graph. What is the work done by this force between (x = 4), and (x = 8)?

20 J

40 J

60 J

80 J



61. **C8L1**

A car engine uses a force of (29 kN) to power a car at an average speed of (7.5 m/s). What is the average power of the engine?
يؤثر محرك سيارة بقوة مقدارها (29 kN) لتشغيل السيارة بمتوسط سرعة مقدارها (7.5m/s ) ، ما هو متوسط القدرة لهذا المحرك؟

217.50 kW

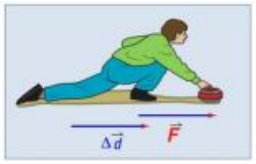
3.87 kW

2.17 kW

0.26 kW

62. **C8L1**

In a curling game, a player does work to slide a stone of mass (2.5kg) from rest on the ice surface, as shown in the figure. He exerts a horizontal force of (40N) on the stone over a distance of (1.5m) then releases the stone. What is the velocity of the stone at the point of release on ice surface?




6.93m/s

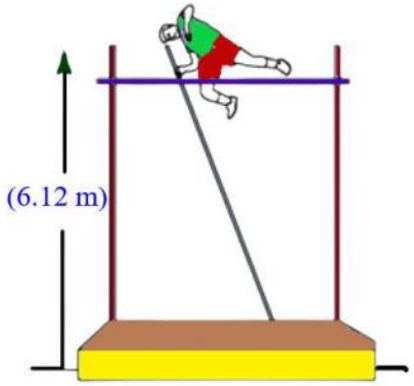
3.45m/s

2.37m/s

13.8m/s

63. **C8L2**

**A pole vaulter of mass ( 52 kg ) jumps to a height of ( 6.12 m ) to clear the bar as shown in the figure . What is his gravitational potential energy at this height ?**




**3119 J**

**318.2J**

**83.27 J**

**509.6 J**

64. **C7L1**

**A piece of iron is placed ( 23 cm ) away from a piece of nickel that has a mass of ( 46 kg) .) . Given that the force of gravity between them is ( $2.9 \times 10^{-8}$ N ), what is the mass of the piece of iron?**

**0.50 kg**

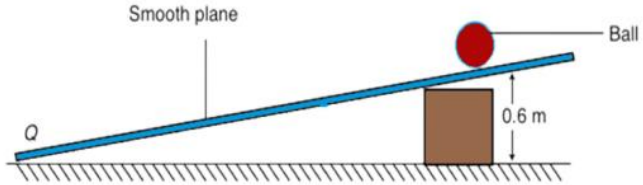
**0.90 kg**

**5.00 kg**

**2.50 kg**

65. **C8L3**

**A ball is released at the top of a smooth inclined plane that is (0.6 m) above ground as shown in the figure. What is the velocity of the ball when it reaches the bottom of the inclined plane?**




A. 3.43 m/s

B. 11.8 m/s

C. 5.88 m/s

D. 4.90 m/s

66. **C7L1**

**Neptune is nearly at ($10^{13}$m) from the sun, and Saturn is nearly at ($10^{12}$m) from the sun. Which of the following is the correct ratio of their periods?**

$$\frac{T_{Neptune}}{T_{Saturn}} = \sqrt{1000}$$

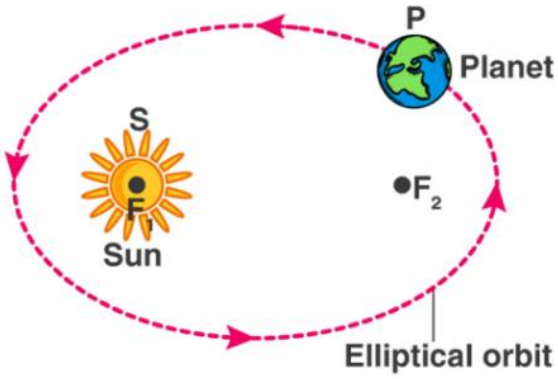
$$\frac{T_{Neptune}}{T_{Saturn}} = \sqrt{10}$$

$$\frac{T_{Neptune}}{T_{Saturn}} = 100$$

$$\frac{T_{Neptune}}{T_{Saturn}} = 10$$

67. **C7L1**

**Which of the following physics laws describes the planets orbits as represented by the figure below?**




a. ○ **Kepler's First Law**

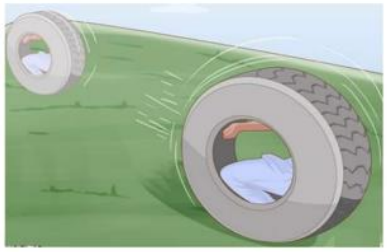
b. ○ **Kepler's Second Law**

c. ○ **Kepler's Third Law**

d. ○ **Newton's Universal Law of Gravitation**

68. **C8L2**

**When a car wheel rolls down over a hill, which of the following statement is true?**



a. ○ **The wheel will have both rotational and translational kinetic energies**

**يمتلك الإطار طاقة حركية انتقالية بالإضافة الى طاقة حركية دورانية**

b. ○ **The wheel will have rotational kinetic energy only**

**يمتلك الإطار طاقة حركية دورانية فقط**

c. ○ **The wheel will have translational kinetic energy only**

**يمتلك الإطار طاقة حركية انتقالية فقط**

d. ○ **The wheel will not have any type of kinetic energy**

**لا يمتلك الإطار أي نوع من الطاقة الحركية**

69. **C7L2**

How does the period of a satellite orbiting Earth relate to its mass and **orbital radius**?

a. ○ **Satellite period increases when its orbital radius increases**
يزداد الزمن الدوري للقمرالصناعي بزيادة نصف قطر مداره

b. ○ **Satellite period increases when its orbital radius decreases**

c. ○ **Satellite period increases when its mass increases**
يزداد الزمن الدوري للقمرالصناعي بزيادة كتلته

d. ○ **Satellite period increases when its mass decreases**
يزداد الزمن الدوري للقمر عندما تقل كتلته

70. **C9L1**

**The SI unit of pressure is pascal (Pa). Which of the following units is equivalent to (1 Pa)?**

**$N/m^2$**

**$N.m^2$**

**N/m**

**N.m**

71. **C7L2**

**The gravitational field strength on Earth surface is (9.81N/kg). What is the radius of Earth?**

**اذا كانت شدة مجال الجاذبية على سطح الأرض تساوي (9.81N/kg). ما مقدار نصف قطر الأرض ؟**

**Earth's mass($m_E$)= $5.97 \times 10^{24}$ kg**

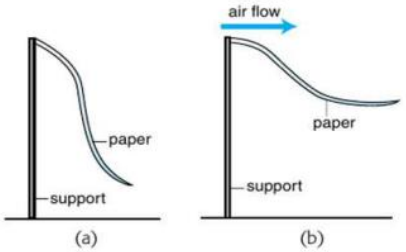
**6370 km**

**63700 km**

**637.0 km**

72. **C9L3**

**The Diagram shows a piece of paper hanging from one end of a support (a). When air is blown across the upper surface of the paper, it moves up as shown in (b). Which Physics principle explains what happened to the paper?**




**A. BERNOULI'S PRINCIPLE**

**B. PASCAL'S PRINCIPLE**

**C. ARCHIMEDES PRINCIPLE**

D. **ENERGY CONSERVATION PRINCIPLE**

73. **C7L2**

**For a satellite to move around Earth in a circular orbit of radius (10km), what orbital speed must it have?**

**[Earth's mass ($m_E$)= $5.97 \times 10^{24}$ kg]**

**6310 m/s**

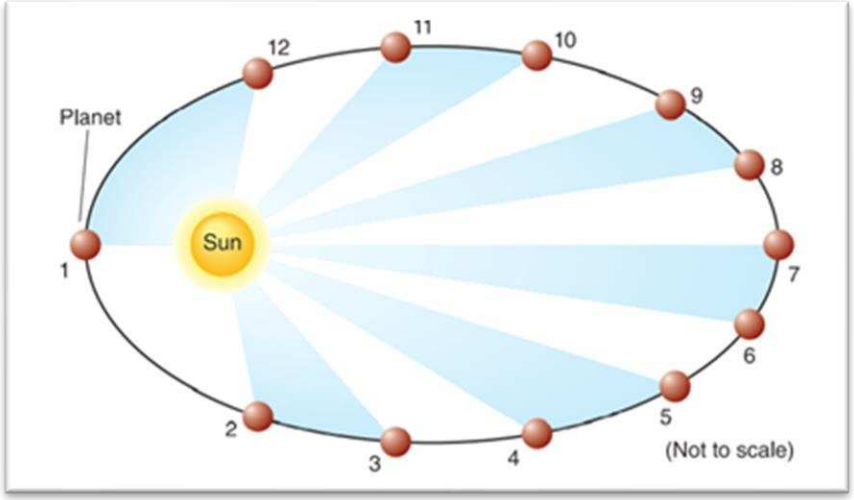
**387 m/s**

**3870m/s**

**631m/s**

74. **C7L1**

**The figure shows the path of Mars around the Sun, in which position does Mars have the greatest linear velocity?**




1

2

7

4

75. **C7L1**

**Two objects each with mass m at a distance r from each other. The gravitational force between them is F. If the masses of the objects are increased to be 3r, what will be the gravitational force between the objects?**

- 9F
- F/9
- 3F
- F/3

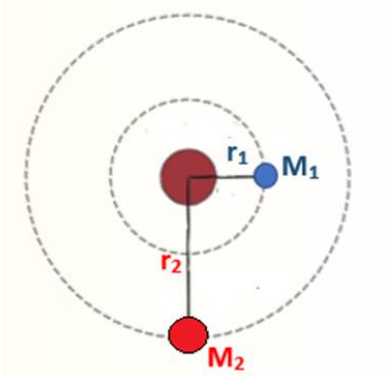
76. **C7L2**

**A satellite orbit around a planet at a height of ($4.2 \times 10^7$ m) from the planet's center and completes one revolution in a time of ($8.7 \times 10^4$ s). What is the mass of the planet?**

- $5.8 \times 10^{24}$ kg
- $2.9 \times 10^{24}$ kg
- $8.5 \times 10^{24}$ kg
- $6.7 \times 10^{24}$ kg

77. **C7L1**

**Two moons $M_1$, $M_2$ with different masses are moving in their orbits around a planet, as shown in the figure. Which of the following is true for their periods in their orbits?**




a. $M_2$ has a smaller period than $M_1$

b. $M_2$ has a greater period than $M_1$

c. $M_2$ and $M_1$ have the same period

d. It can't be determined

78. **C7L1**

**According to Kepler's third law, which of the following represents the mathematical relationship between periods of planets and their mean distances away from the Sun?**

$\left(\frac{T_A}{T_B}\right)^2 = \left(\frac{r_A}{r_B}\right)^3$

$\left(\frac{T_A}{T_B}\right)^3 = \left(\frac{r_A}{r_B}\right)^2$

$\left(\frac{T_A}{r_B}\right)^2 = \left(\frac{r_A}{T_B}\right)^3$

$\left(\frac{T_A}{r_A}\right)^2 = \left(\frac{T_B}{r_B}\right)^3$

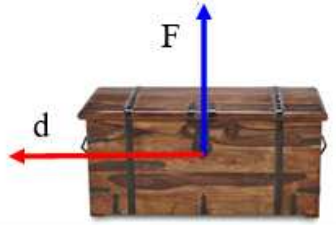
79. **C7L2**

a planet has a mass of $9.1x10^{26}kg$ and its radius is $1.8x10^{7}m$. What is the gravitational field strength on the planet's surface?

- $1.9x10^{2}$ N/kg
- $7.6x10^{2}$ N/kg
- $9.1x10^{2}$ N/kg
- $6.7x10^{26}$ N/kg

80. **C8L1**

(3) G11Ph3G-A box is pulled to move on the flour for a distance d as seen in the figure. What is the work done on the box done by the normal force F?

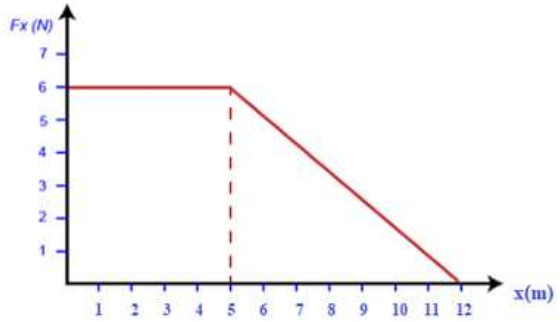



- F. d
- – F. d
- Zero
- F.d sin ɵ

81. **C8L1**

**G11Ph4G-A Force is acting on an object as shown in the figure below.**

**How much is the total work done by the acting force?**




72 J

51 J

30 J

21 J

82. **C8L1**

(5) **G11Ph5G-Ahmed does 176 J of work lifting himself 0.3 m at constant speed through 10 s. what is Ahmad's power?**

**17.6 W**

**52.8 W**

**1760 W**

**528 W**

83. **C8L1**

i- Which of the following`s physical quantity is measured in the international system of units in terms of $(kg\ m^2 s^{-3})$ ?

- ☐ Work
- ☐ Force
- ☐ Power
- ☐ Energy

84. **C8L1**

– A dolphin is pulled by a rope making $(60^{\circ})$ above the horizontal with a force of $(550\ N)$ over a distance of $(35\ m)$. What is the magnitude of work done on the dolphin?

- ☐ $3.3 \times 10^4\ J$
- ☐ $1.7 \times 10^4\ J$
- ☐ $9.6 \times 10^3\ J$
- ☐ $1.9 \times 10^4\ J$

85. **C8L2**

– What is the mass of a ball has kinetic energy of $(2.5\ J)$and moving at $(5.0\ m^2)$?

- ❒ $0.10\ kg$
- ❒ $0.15\ kg$
- ❒ $0.20\ kg$
- ❒ $0.40\ kg$

87. **C8L1**

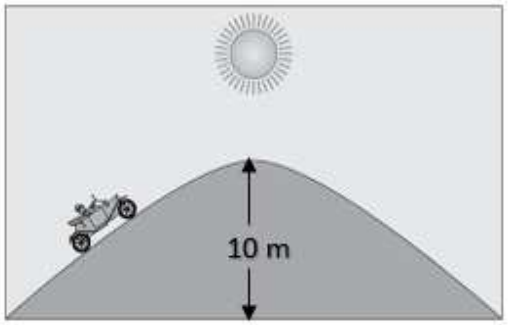
A pump was used to raise the amount of water weighing (200 N) to a height of (5.0 m) during (2.0 s) . What is power of the pump?

- 4900 W
- ❒ 500 W
- 900 W
- ❒ 100 W

86. **C8L2**

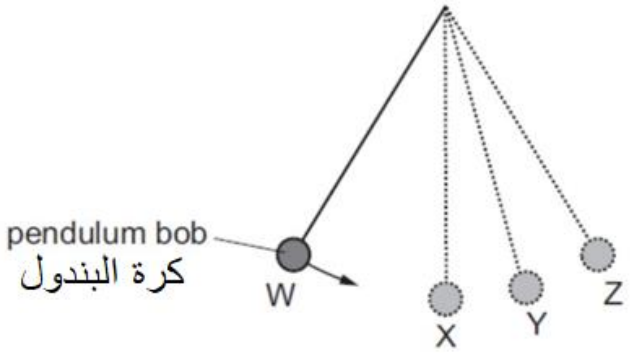
**According to the figure below, What is the change of the gravitational potential energy of the 800 Kg car when it travels from the bottom of the hill to the top?**

1. $7.84 \times 10^5$ J
2. $7.84 \times 10^4$ J
3. $7.84 \times 10^3$ J
4. 125 J



88. **C8L3**

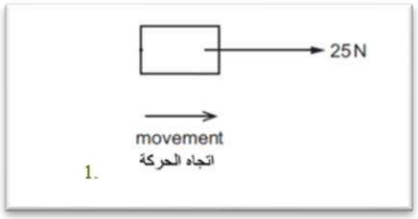
**A pendulum bob shown in the figure below swings along the path WXYZ and back again. Which of the following statements describes the total energy of the bob if the energy of the system is conserved?**

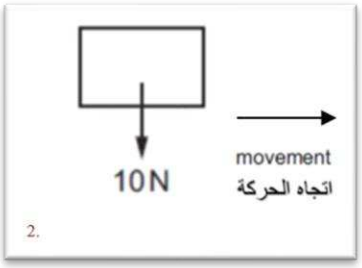


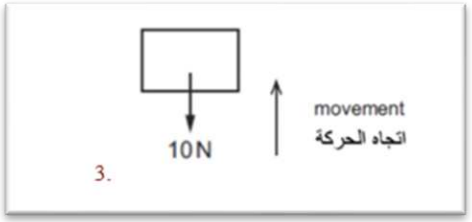

1. **It has the same value at W, X, Y and Z**
2. **It has a maximum value at X**
3. **It has a maximum value at Y**
4. **It has a maximum value at Z**

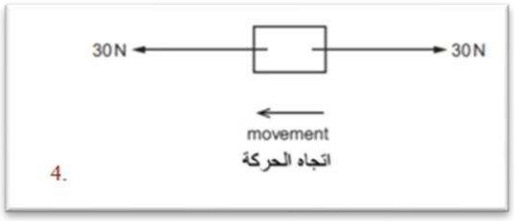
89. **C8L1**

**Which of the following figures represents a total positive work done by an external force on an object?**



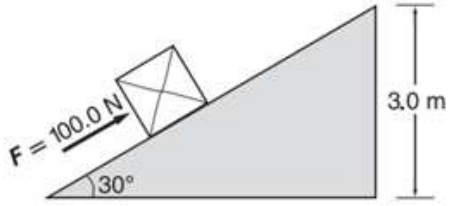



90. **C8L1**

**The box in the diagram below was pushed over the ramp with a net force of 100 N. What is the work done on the box to move it from the bottom of the ramp to the top?**
**(Hint: sin 30₀ = 0.5)**

1. **600 J**
2. **300 J**
3. **150 J**
4. **260 J**



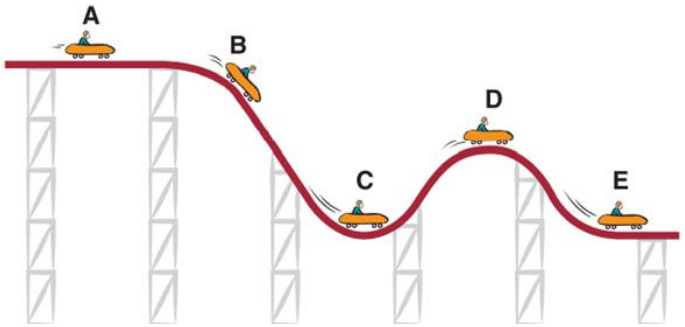

91. **C8L2**

**A ball is launched vertically upwards. The ball reaches a height h and gains a potential energy GPE.**
**If the same ball is launched vertically upward from the same position to reach a height 2*h*,**
**what is the new potential energy at the height 2*h*?**

1. **2GPE**
2. **4GPE**
3. **1GPE**
4. **0.5GPE**

92. **C8L3**

**The diagram below shows a rollercoaster ride. The cart moves through different positions at different heights. What happens to the Kinetic and Potential energy as the cart goes from point B to point C?**




1. **Kinetic energy increases and gravitational potential energy decreases**

2. **Kinetic energy decreases and gravitational potential energy increases**

3. **Both kinetic and gravitational potential energy increase**

4. **Both kinetic and gravitational potential energy stay the same**

93. **C8L1**

**A force of 825N is exerted horizontally, pushing a car a distance of 35 m in the same direction. How much is the work done on the car?**

1. $2.89 \times 10^4$ J
2. $2.36 \times 10^2$ J
3. 0.0 J
4. $7.9 \times 10^1$ J

94. **C8L2**

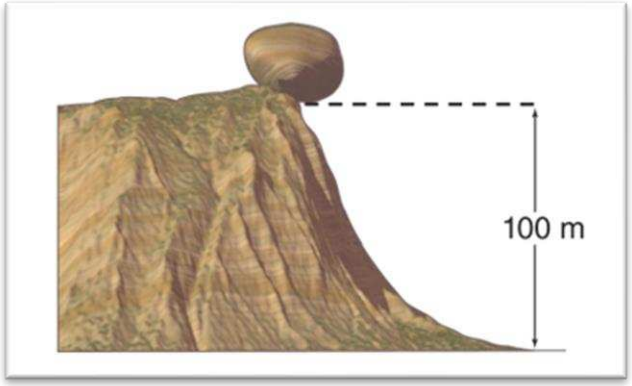
**A truck of mass of 4000 Kg travelling at a constant speed of 15 m/s. How much is the kinetic energy of the truck?**

1. $4.5 \times 10^5$ J
2. $9.0 \times 10^5$ J
3. $6.0 \times 10^4$ J
4. $1.2 \times 10^5$ J

95. **C8L3**

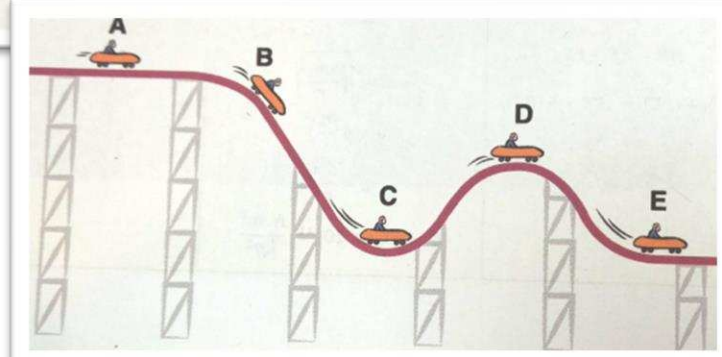
**The figure below shows a rock sliding without friction from the rest down a hill with a vertical distance of 100 m. What is the velocity of the rock when it hits the ground?**

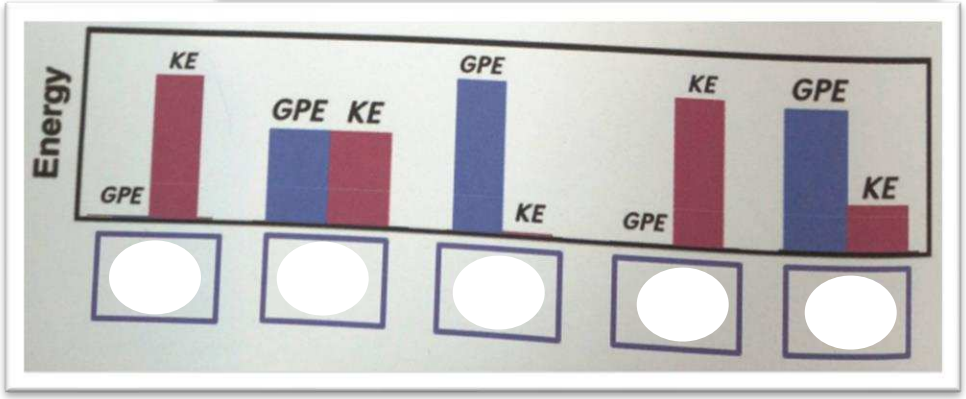
1. 44.3 m/s
2. 14.1 m/s
3. 4.7 m/s
4. 180 m/s



96. **C8L3**

The figure below shows a roller-coaster car when it is at rest at point A until it reaches point E. The bar graphs show the total mechanical energy of the car in different positions. Fill the blank under each bar with the correct car position (A,B,C,D andE) to match the Car's energy.



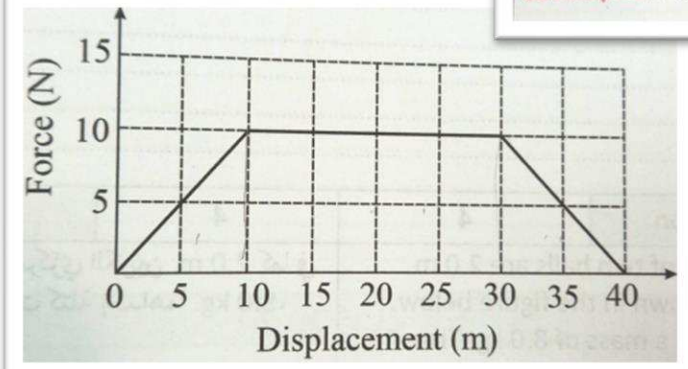




97. **C8L1**

The graph shows the relationship between the force exerted on and the displacement of an object being pulled.

a. Find the work done to pull the object 40 m.

b. Calculate the power that would be developed if the work is done in 8.0 s



98. **C7L1**

**19- Mercury orbits the Sun with an orbital radius of $(5.8 \times 10^{10}\ m)$. Given that the mass of the Sun is $(2.0 \times 10^{30}\ kg)$, and the mass of Mercury is $(3.3 \times 10^{23}\ kg)$.**

**- Calculate the period of Mercury's orbit.**

**- Calculate the gravitational force between Mercury and the Sun.**

**- Calculate the orbital velocity of Mercury around the Sun.**

99. **C8L1**

**19-** A $(1600kg)$ vehicle moves with a velocity of $(20\ m/s)$.

- Calculate the work required to reduce the velocity to $(5.0\ m/s)$ .

| 100. | 101. |
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$$g = 9.8\ m/s^2$$

| Module (10) Energy and It's Conservation | Module (7) Gravitation | Module (12) States of Matter |
|---|---|---|
| $W = Fd\cos(\theta)$ | $\left(\frac{T_A}{T_B}\right)^2 = \left(\frac{r_A}{r_B}\right)^3$ | $P = \frac{F}{A}$ |
| $W = \Delta E$ | $F_G = \frac{Gm_1 \times m_2}{r^2}$ | $\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$ |
| $P = \frac{\Delta E}{t} = \frac{W}{t}\ ,\ P = Fv$ | $T = \sqrt{\left(\frac{4\pi^2}{G \times m_s}\right)r^3} = 2\pi\sqrt{\left(\frac{r^3}{G \times m_s}\right)}$ | $P_1V_1 = P_2V_2\ , T\ constant$ |
| $KE_{trans} = \frac{1}{2}mv^2$ | $v = \sqrt{\left(\frac{Gm_E}{r}\right)}$ | $\frac{V_1}{T_1} = \frac{V_2}{T_2}\ , P\ constant$ |
| $GPE = mgh$ | $a = g\left(\frac{r_b}{r}\right)^2$ | $PV = nRT$ |
| $MK = KE + PE$ | $g = \frac{Gm}{r^2}$ | $\frac{F_2}{A_2} = \frac{F_1}{A_1}$ |
| $(KE)_i + (PE)_i = (KE)_f + (PE)_f$ | $G = 6.67 \times 10^{-11}\ \frac{N.m^2}{kg^2}$ | $P = \rho hg$ |
| | | $F_{buoyant} = (F_{bottom} - F_{top})$ |
| | | $F_{buoyant} = \rho_{(fluid)}Vg$ |
| | | $R = 8.31\ Pa.\frac{m^3}{mol.K}$ |

| Use the following formula if needed | استخدم المعادلات التالية إن لزم |
|---|---|

$g = 9.8\ m/s^2$

| Module (10) Energy and It's Conservation | Module (7) Gravitation | Module (12) States of Matter |
|---|---|---|
| $W = Fd\cos(\theta)$ | $\left(\frac{T_A}{T_B}\right)^2 = \left(\frac{r_A}{r_B}\right)^3$ | $P = \frac{F}{A}$ |
| $F = ma$ | $F_G = \frac{Gm_1 \times m_2}{r^2}$ | |
| $W = \Delta E$ | $T = \sqrt{\left(\frac{4\pi^2}{G \times m_E}\right) r^3}$ | |
| $P = \frac{\Delta E}{t} = \frac{W}{t}$ , $P = Fv$ | $= 2\pi \sqrt{\left(\frac{r^3}{G \times m_E}\right)}$ | |
| $KE_{trans} = \frac{1}{2}mv^2$ | $v = \sqrt{\left(\frac{Gm_E}{r}\right)}$ | |
| $GPE = mgh$ | $a = g\left(\frac{r_b}{r}\right)^2$ | |
| $MK = KE + PE$ | $g = \frac{Gm}{r^2}$ | |
| $(KE)_i + (PE)_i = (KE)_f + (PE)_f$ | $G = 6.67 \times 10^{-11}\ \frac{N.m^2}{kg^2}$ | |