المملكة العربية السعودية

وزارة التعليم

MINISTRY OF EDUCATION

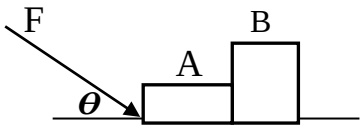
هام

لكل المهتمين و المهتمات

بدروس و مراجع الجامعية

مدونة المناهج السعودية eduschool40.blog

1) A constant force of 46 N is applied at an angle of 60º to a block A of a mass 10 kg as shown in the figure. Block A pushes another block B of mass 36 kg. Assuming a frictionless surface, the total acceleration of the blocks along the x-axes is:



a) 1.5m/s² ***b) 0.25m/s²*** ***c) 0.5m/s²*** ***d) 2m/s²***

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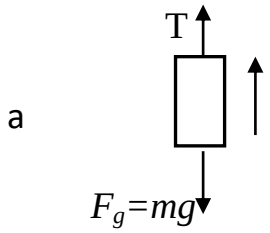
2) An elevator of total mass 2000 kg moves upward. The tension in the cable pulling it is 24000N. The acceleration of the elevator is:



a) 2.2 m/s² ***b) 9.8 m/s²*** ***c) 12 m/s²*** ***d) 3.6 m/s²***

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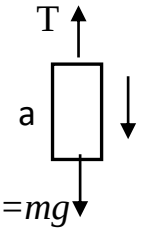
3) A 70 kg man stands on a spring scale in an elevator that has a downward acceleration of 2.8m/s². The scale will read:



a) 980 N ***b) 680 N*** ***c) 490 N*** ***d) 343 N***

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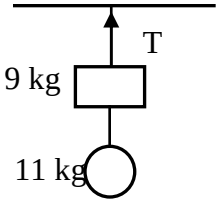
4) Two blocks are suspended by a rope as shown in the figure, the tension in the top rope is:



a) 196 N ***b) 88.5 N*** ***c) 19.6 N*** ***d) 107.8 N***

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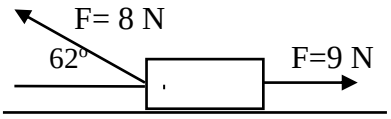
5) From the figure, the acceleration of the block of mass 3 kg moving along x-axis is:



a) 2.45 m/s² ***b) 1.75 m/s²*** ***c) -2.3 m/s²*** ***d) 3 m/s²***

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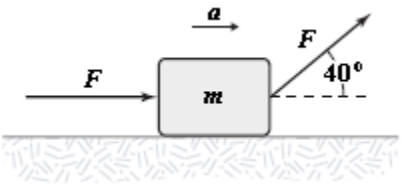
6) If F = 4.0 N and m = 2.0 kg, the magnitude of the acceleration for the block shown below if the surface is frictionless is:



a) 5.3 m/s² ***b) 4.4 m/s²*** ***c) 3.5 m/s²*** ***d) 6.2 m/s²***

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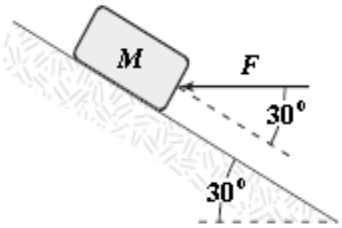
7) A block is pushed up a frictionless 30° incline by an applied force as shown. If F = 25 N and M = 3.0 kg, what is the magnitude of the resulting acceleration of the block?



a) 2.3 m/s² ***b) 4.6 m/s²*** ***c)3.5 m/s²*** ***d) 2.9 m/s²***

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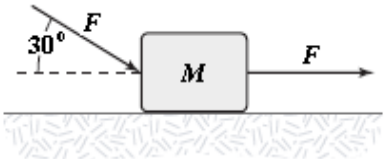
8) The horizontal surface on which the block slides is frictionless. If F = 20 N and M = 5.0 kg, what is the magnitude of the resulting acceleration of the block?



a) 5.3 m/s² ***b) 6.2 m/s²*** ***c) 7.5 m/s²*** ***d) 4.7 m/s²***

9) A 5.0 kg object is suspended by a string from the ceiling of an elevator that is accelerating downward at a rate of 2.6 m/s^2. What is the tension in the string?

a) 36 N ***b) 49 N*** ***c) 62 N*** ***d) 12 N***

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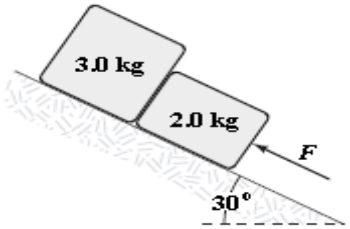
10) The surface of the inclined plane shown is frictionless. If F = 30 N, what is the magnitude of the force exerted on the 3.0kg block by the 2.0kg block?



a) 18 N ***b) 27 N*** ***c) 24 N*** ***d) 15 N***

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11) If P = 6.0 N, what is the magnitude of the force exerted on block 1 by block 2?

a) 6.4 N ***b) 5.6 N*** ***c) 4.8 N*** ***d) 7.2 N***

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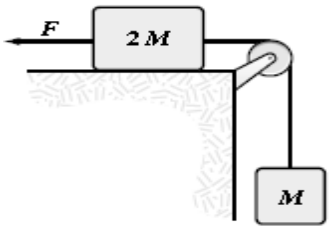
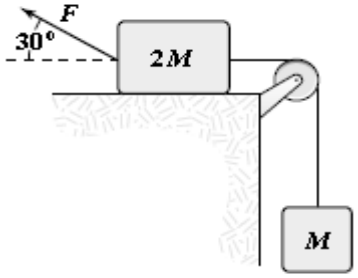
12) If F = 40 N and M = 1.5 kg, what is the tension in the string connecting M and 2M? Assume that all surfaces are frictionless.



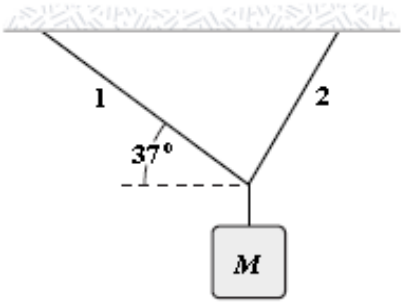
a) 13N ***b) 23N*** ***c) 23N*** ***d) 15N***

13) If F = 40 N and M = 2.0 kg, what is the magnitude of the acceleration of the suspended object? All surfaces are frictionless.



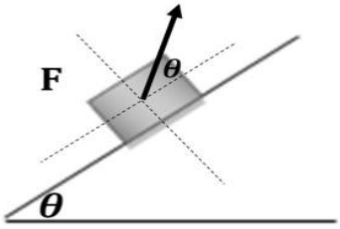
a)1.2 m/s^2 b) 2 m/s^2 c) 1.2 m/s^2 d) 2.5 m/s^2

14) An object of unknown weight is suspended as shown. The tension in rope 1 is 25 N, and the tension in rope 2 is 31 N. What is the weight of the suspended object?



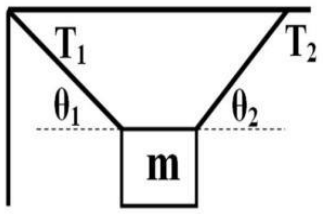
a) 36 N b) 40 N c) 33 N d) 50 N

15) ***A box of mass m= 62 kg is pushed up at constant speed over the frictionless inclined plane of angle θ=42° by an applied force F as shown in the figure. The magnitude of applied force F is:***



a) 46.5 N b) 574.1 N c) 607.6 N d) 4.6.6 N

16) ***A block of mass m = 10 kg is hanging by two ropes as shown in the figure. If $\theta_1 = 30^o$ and $\theta_2 = 45^o$, by using Newton's laws, the y-component of net force ($F_{net,y}$) on the block is:***



a) $T_1 \sin 45 + T_2 \sin 30 - mg = 0$

b) $T_1 \sin 30 + T_2 \sin 45 - mg = 0$

c) $T_1 \sin 30 + T_2 \sin 45 - mg = m\, a_y$

d) $T_1 \sin 45 + T_2 \sin 30 - mg = m\, a_y$

1) If the x-component of a vector r is 3.2 m and the y-component is 6.2 m, then vector r in unit vector notation is:

a) $2.6i-2.3j$ b) $-2.3i+2.6j$ c) $6.2i+3.2j$ d) $3.2i+6.2j$

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2) The displacement of a particle moving from $r_1 = -5i + 2j + 2k$ to $r_2 = -8i + 2j - 2k$ is:

a) $-7i+12j$ b) $3i+4k$ c) $7i-12j$ d) $-3i-4k$

---

3) A Positron undergoes a displacement, $\Delta r = 2i - 3j + 6k$ ending with the position vector, $r = 3j - 4k$ in meters. What is the initial position vector:

a) $r_{1=} -2i +6j -10k$ b) $r_{1=} 5i -6j -11k$

c) $r_{1=} 7i -3j -4k$ d) $r_{1=} -5i +7j -k$

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4) If a particle's displacement is given by $\Delta r = 12i + 3k$ its velocity during the time interval of 2 s is:

a) $v_{avg}=6i+1.5k$ b) $v_{avg}=8i+3j$ c) $v_{avg}=5i+2j$ d) $v_{avg}=-5i-2j$

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5) The components of a car's velocity as a function of time are given by: $v_x = 2t + 3$, $v_y = 3t^2 + 3$ its velocity vector at t = 2s is:

a) $7i+15j$ b) $5i+3j$ c) $7i+7j$ d) $9i+11j$

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6) If the position of a particle is given by: $\boldsymbol{r} = (3t^2 + 2t)\,\boldsymbol{i} + (t^3 + 1)\,\boldsymbol{j}$ its velocity vector at t = 1s,

a) $v=3i-8j$ b) $v=8i+3j$ c) $v=5i+2j$ d) $v=-5i-2j$

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7) In question 6, the average acceleration from t = 1s to t = 2s is:

a) $a_{avg}=2i-6j$ b) $a_{avg}=9i+6j$ c) $a_{avg}=6i+9j$ d) $a_{avg}=-3i-9j$

---

8) In question 6, the acceleration at t = 2s is:

a) $a=6i-8j$ b) $a=6i+6j$ c) $a=6i+9j$ d) $a=6i+12j$

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9) The components of a car's velocity as a function of time are given by $v_x = 5t^2 - 5$, $v_y = -4t^3$. The acceleration components are:

a) $a_x = 10t$, $a_y = -12t^2$ b) $a_x = 4t$, $a_y = -6t^2$
c) $a_x = 6t$, $a_y = -15t$ d) $a_x = 12t$, $a_y = -9t^2$

---

10) The acceleration is equal to:

a) dr/dt b) dv/dt c) $\Delta r/\Delta t$ d) dx/dt

---

11) A particle is moving with initial velocity $v_o = 2i + 4j$ m/s and acceleration $a = 5i + 8j$ m/s^2, the x-component v_x of the final velocity at t = 7s is:

a) 7 m/s b) 17 m/s c) 27 m/s d) 37 m/s

12) The maximum range of a projectile is at a launch angle:

a) 0^o b) 45^o c) 50^o d) 90^o

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13) In the projectile motion, the horizontal velocity component V_x remains constant because the acceleration in the horizontal direction is:

a) $a_x = g$ b) $a_x > g$ c) $a_x = 0$ d) $a_x > 0$

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14) Cannon is firing a ball from ground level at an angle of 15^o above the horizontal. If the ball speed is 200m/s, the horizontal distance of the ball just before it hits the ground is:

a) 4.59 km b) 3.19 km c) 6.25 km d) 2.04 km

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15) A projectile is fired from a ground at angle 45^o above the horizontal. If it reaches the ground at 60m from the starting point, the initial velocity is:

a) 24.2 m/s b) 16 m/s c) 9.8 m/s d) 31.3 m/s

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16) A baseball leaves the bat with initial velocity of $v_o = 10i+20j$ m/s, its range is:

a) 40.8 m b) 102 m c) 20.4 m d) 61.2 m

---

17) A ball is projected above the horizontal with an initial velocity vo= 25*i*+25*j* m/s. The maximum height the ball raises is:

a) 11 m b) 20.4 m c) 2.4 m d) 31.89 m

---

18) A ball is kicked with speed of 25m/s at an angle of 35º above the ground. Its time of flight is:

a) 5.9 s b) 11 s c) 3.25 s d) 2.93 s

---

19) A ball is kicked from the ground with an initial speed of 4 m/s at an upward angle of 30º. The time the ball takes to reach its maximum height is:

a) 0.2 s b) 0.31 s c) 0.41 s d) 0.51 s

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20) A ball is kicked from the ground with initial speed of 15 m/s, the maximum horizontal distance the ball travels is:

a) 40.8 m b) 22.96 m c) 25.5 m d) 63.8 m

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21) A projectile is fired from the ground level over level ground with an initial velocity that has a vertical component of 20 m/s and a horizontal component of 30 m/s. The distance from launching to landing points is:

a) 40 m b) 60 m c) 20.4 m d) 122 m

22) In question 21, the maximum height the projectile reached is:

a) 40 m b) 60 m c) 20.4 m d) 122 m

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23) In question 21, the time the projectile takes to reach its maximum height is:

a) 4.1 s b) 2.05 s c) 1.05 s d) 0.5 s

---

24) A player runs in a circular tract has a radius of 50 m with a constant speed of 10 m/s. The magnitude of his centripetal acceleration is:

a) 0.2 m/s^2 b) 2 m/s^2 c) 5 m/s^2 d) 20m/s^2

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25) A car rounds a 20 m radius curve at 12 m/s, the magnitude of its acceleration is:

a) zero b) 5 m/s^2 c) 7.2 m/s^2 d) 4 m/s^2

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26) A particle moves at constant speed in a horizontal circle of radius 8 m, making a complete circle in 5 s. the acceleration is:

a) 8 m/s^2 b) 12.6 m/s^2 c) 10 m/s^2 d) zero

1) A 12 N box moves with constant speed. If the coefficient of kinetic friction μ_k=0.24, the kinetic friction force (f_k) acting on the block is:

a) 2.88 N ***b) 50 N*** ***c) 0.2 N*** ***d) 5 N***

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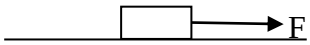
2) A force of 45 N acts on a 20 kg box on the floor but the box doesnot move, the magnitude of static friction force is:



a) zero ***b) 20 N*** ***c) 10 N*** ***d) 45 N***

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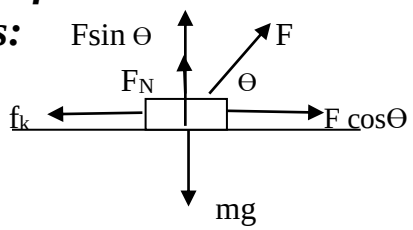
3) A 3.5kg block is pulled at a constant velocity along a horizontal floor by a force F = 15 N that makes an angle of 40º with the horizontal. The coefficient of kinetic friction is:



a) 0.34 ***b) zero*** ***c) 0.47*** ***d) 0.1***

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4) A block of weight 5 N moves with a constant speed by a force of 2 N. The value of the coefficient of friction is:

a) 0.3 ***b) 0.4*** ***c) 0.5*** ***d) 0.6***

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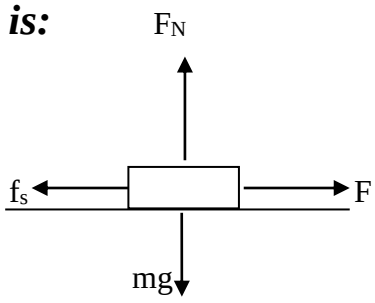
5) The coefficient of static friction between a 5 kg block and the horizontal surface is 0.1. The maximum horizontal force that can be applied to the block just before starting to move is:



a) 19.6 N ***b) 24.5 N*** ***c) 4.9 N*** ***d) 9.8 N***

6) A boy of 55 kg running in circular path of R= 3 m at a velocity of 6 m/s. the centripetal force is:

a) 660 N ***b) 110 N*** ***c) 330 N*** ***d) 165 N***

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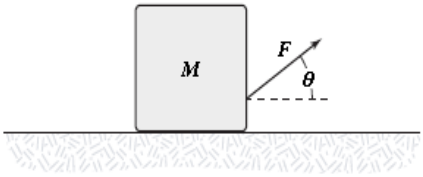
7) The block shown is pulled across the horizontal surface at a constant speed by the force shown. If M = 5.0 kg, F = 14 N and Θ = 35º, what is the coefficient of kinetic friction between the block and the horizontal surface?



a) 0.44 ***b) 0.33*** ***c) 0.28*** ***d) 0.52***

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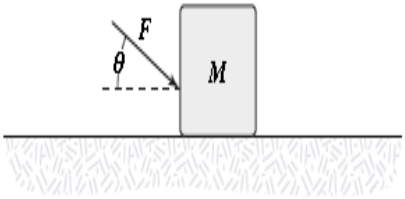
8) A block is pushed across a horizontal surface by the force shown. If the coefficient of kinetic friction between the block and the surface is 0.30, F = 20 N, Θ = 30º, and M = 3.0 kg, what is the magnitude of the acceleration of the block?



a) 2.8 m/s^2 ***b) 1.8 m/s^2*** ***c) 5.4 m/s^2*** ***d) 3.3 m/s^2***

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9) An airplane travels 80 m/s as it makes a horizontal circular turn which has a 0.80 km radius. What is the magnitude of the resultant force on the 75 kg pilot of this airplane?

a) 0.6 kN ***b) 0.85 kN*** ***c) 0.5 kN*** ***d) 0.71 kN***

10) Two boxes slide on a rough horizontal surface, where m_1= 12 kg and m_2 = 16 kg, with constant speed. Which statement is true?

a) $f_{k1} = f_{k2}$ ***b)*** $f_{k1} > f_{k2}$ ***c)*** $f_{k1} = f_{k2} = 0$ ***d)*** $f_{k1} < f_{k2}$

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