مدونة المناهج السعودية

https://eduschool40.blog

الموقع التعليمي لجميع المراحل الدراسية

في المملكة العربية السعودية

Questions:

1- The magnitudes of two vectors A and B are A = 5 units and B = 2 units. Find the largest and smallest values possible for the magnitude of the resultant vector R = A + B.
(a) 3 and 5
(b) 2 and 6
(c) 7 and 3
(d) 5 and 2
(e) 8 and 3

2- Which of the following are vectors and which are not:
(a) Force
(b) Temperature
(c) The volume of water in a can
(d) The ratings of a TV show
(e) The height of a building
(f) The velocity of a sports car
(g) The age of the Universe

3- A vector lying in the *xy* plane has components of opposite sign. The vector must lie in which quadrant?
(a) the first quadrant
(b) the second quadrant
(c) the third quadrant
(d) the fourth quadrant
(e) either the second or the fourth quadrant.

4- Vector A lies in the xy plane. Both of its components will be negative if it points from the origin into which quadrant?
(a) the first quadrant
(b) the second quadrant
(c) the third quadrant
(d) the fourth quadrant
(e) the second or fourth quadrants

5- The magnitude of vector A is 8 km, and the magnitude of B is 6 km. Which of the following are possible values for the magnitude of A + B? Choose all possible answers.
(a) 10 km
(b) 8 km
(c) 0 km
(d) 2 km
(e) -2 km

6- If A = B, what can you conclude about the components of A and B?
(a) They have the same magnitude and same direction
(b) They have the same magnitude and opposite direction
(c) They have different magnitude and same direction
(d) They have different magnitude and opposite direction
(e) none of those answers.

7- If the component of vector A along the direction of vector B is zero, what can you conclude about the two vectors?

(a) They have the same magnitude and same direction

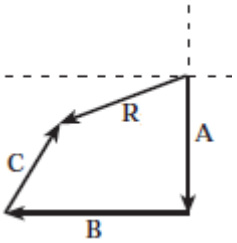
(b) They have the same magnitude and opposite direction

(c) They have different magnitude and same direction

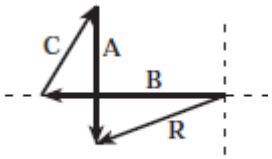
(d) They have different magnitude and opposite direction

(e) none of those answers.

8- Three displacements are A = 200 m, due south; B = 250 m, due west; C = 150 m, 30.0° east of north. Which of the following diagram represent the adding R = A + B + C



(a)



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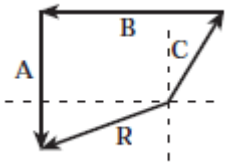
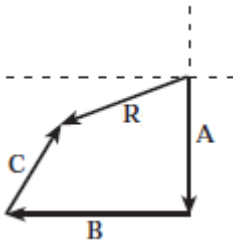
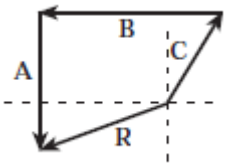


(c)

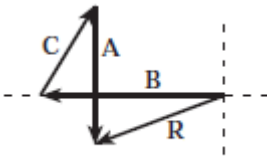
9- Three displacements are A = 200 m, due south; B = 250 m, due west; C = 150 m, 30.0° east of north. Which of the following diagram represent the adding R = B + C + A



(a)

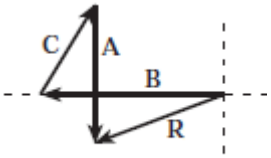


(b)

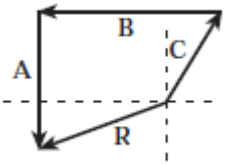


(c)

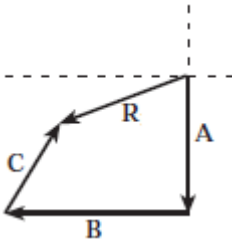
10- Three displacements are A = 200 m, due south; B = 250 m, due west; C = 150 m, 30.0° east of north. Which of the following diagram represent the adding R = C + B + A



(a)



(b)



(c)

11- The polar coordinates of a point are r = 5.50 m and θ = 240°. What are the Cartesian coordinates of this point?

(a) x = 60.5m, y = 78 m

(b) x = -8.9 m, y = 9.6 m

(c) x = -2.75 m, y = -4.76 m

(d) x = 2.34 m, y = 7.98 m

(e) x = 0 m, y = 0 m

12- The Cartesian coordinates of a point are given by (2, y), and its polar coordinates are (r, 30°). Determine the value of y and the value of r.

(a) y = 1.15, r = 2.31

(b) y = 2, r = 0

(c) y = -2.5, r = 1.7

(d) y = -3.8, r = -3.1

(e) y = 1.21, r = -2.1

13- A point in the xy plane has Cartesian coordinates (2.00, -4.00) m. Determine the polar coordinates?

(a) r = 5.5, $\theta = -60.4^0$

(b) r = 4.4, $\theta = -63.4^0$

(c) r = 2.6, $\theta = 30^0$

(d) r = 3.1, $\theta = 45^0$

(e) r = 1.9, $\theta = -70.3^0$

14- A point in the xy plane has Cartesian coordinates (-3.00, 3.00) m. Determine the polar coordinates?

(a) r = 4.2, $\theta = 60^0$

(b) r = 4.4, $\theta = -63.4^0$

(c) r = 4.2, $\theta = 45^0$

(d) r = 3.1, $\theta = 45^0$

(e) r = 1.9, $\theta = -70.3^0$

15- A point in a plane have polar coordinates (2.50 m, 30.0°). Determine the Cartesian coordinates?

(a) (2.17, 1.25) m

(b) (4.10, 3.25) m

(c) (1.8, 1.95) m

(d) (0.77, 1.05) m

(e) (2.00, 3.00) m

16- The vector **A** has an x component of A_x = - 25.0 units and a y component of A_y = 40.0 units. Find the magnitude and direction of this vector.

(a) A = 50 units, $\theta = 60.4^0$

(b) A = 47.2 units, $\theta = 58.0^0$

(c) A = 26.9, $\theta = 30^0$

(d) A = 30.1, $\theta = 95^0$

(e) A = 1.9, $\theta = -70.3^0$

17- Vector A has a magnitude of 35.0 units and points in the direction 325° counterclockwise from the positive x axis. Calculate the x and y components of this vector.

(a) x = 60.5m, y = 78 m

(b) x = 28.6 m, y = -20m

(c) x = -2.75 m, y = -4.76 m

(d) x = 2.34 m, y = 7.98 m

(e) x = 0 m, y = 0 m

18- What is the *y* component of the vector $(10\hat{\imath} - 10\hat{k})$m/s?
(a) 10 m/s
(b) -10 m/s
(c) 0 m/s
(d) 10
(e) none of those answers

19- A particle undergoes two consecutive displacements $\vec{A} = (20\vec{\imath} - 10\vec{\jmath})cm$, $\vec{B} = (-10\vec{\imath} + 10\vec{\jmath})cm$, the magnitude of the resultant displacement is:
(a) 0 cm
(b) 10 cm
(c) – 10 cm
(d) 5 cm
(e) 25 cm

20- A particle undergoes three consecutive displacements $\vec{r_1} = (10\vec{\imath} - 10\vec{\jmath} + 18\vec{k})cm$, $\vec{r_2} = (23\vec{\imath} + 15\vec{\jmath} - 12\vec{k})cm$, $\vec{r_3} = (-13\vec{\imath} + 15\vec{\jmath} - 26\vec{k})cm$, the magnitude of the resultant displacement is:
(a) 34.6 cm
(b) 20 cm
(c) – 20 cm
(d) 10 cm
(e) 55.8 cm

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Exercise for Chapter 1: Vectors

1- The magnitudes of two vectors A and B are **A = 5 units** and **B = 2 units**. Find the largest and smallest values possible for the magnitude of the resultant vector **R = A + B**:

a) 3 and 5
b) 2 and 6
c) 7 and 3
d) 5 and 2

2- Which of the following **are vectors**:

a) Force
b) Temperature
c) Volume
d) Velocity
e) Mass
f) Weight

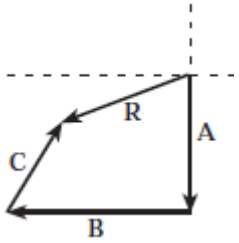
3- **A vector** lying in the ***xy* plane** has **components of negative sign**. The vector must lie in which **quadrant**?

a) First quadrant
b) Second quadrant
c) Third quadrant
d) Fourth quadrant

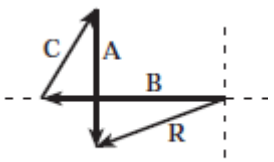
4- The magnitude of vector **A = 8 km**, and the magnitude of **B = 6 km**. Which of the following are possible values for the magnitude of **R= A + B**? Choose all possible answers.

a) 10 km
b) 8 km
c) 0 km
d) 2 km
e) -2 km

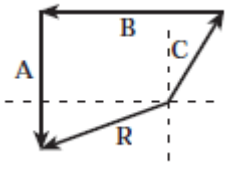
5- Three displacements are A = 2 cm, due south; B = 2.5 cm, due west; C = 1.5 cm, 30.0° east of north. Which of the following diagram represent the adding **R = A + B + C**



(a)



(b)



(c)

6- The polar coordinates of a point are ***R* = 5.50 m** and **θ = 240°**. What are the **Cartesian coordinates (x,.y)** of this point?

(a) x = 60.5m, y = 78 m
(b) x = -8.9 m, y = 9.6 m
(c) x = -2.75 m, y = -4.76 m
(d) x = 2.34 m, y = 7.98 m
(e) x = 0 m, y = 0 m

7- A point in the xy plane has **Cartesian coordinates (x,y) = (2, -4) m**. Determine the **polar coordinates (R, θ)** ?

(a) r = 5.5, θ = -60.4^0
(b) r = 4.4, θ = -63.4^0
(c) r = 2.6, θ = 30^0
(d) r = 3.1, θ = 45^0
(e) r = 1.9, θ = -70.3^0

8- What is the ***y* component** of the vector $(10\hat{\imath} - 10\hat{k})$m/s?

(a) 10 m/s
(b) -10 m/s
(c) 0 m/s
(d) 10
(e) none of those answers

9- A particle undergoes two consecutive displacements

$$\vec{A} = (20\vec{\imath} - 10\vec{\jmath})cm,$$
$$\vec{B} = (-10\vec{\imath} + 10\vec{\jmath})cm,$$

the magnitude of the **resultant displacement R** = :

(a) 0 cm
(b) 10 cm
(c) – 10 cm
(d) 5 cm
(e) 25 cm

10- A particle undergoes three consecutive displacements

$$\overrightarrow{A_1} = (10\vec{\imath} - 10\vec{\jmath} + 18\vec{k})cm,$$
$$\overrightarrow{A_2} = (23\vec{\imath} + 15\vec{\jmath} - 12\vec{k})cm,$$
$$\overrightarrow{A_3} = (-13\vec{\imath} + 15\vec{\jmath} - 26\vec{k})cm,$$

the magnitude of the **resultant displacement R=** :

(a) 34.6 cm
(b) 20 cm
(c) – 20 cm
(d) 10 cm
(e) 55.8 cm

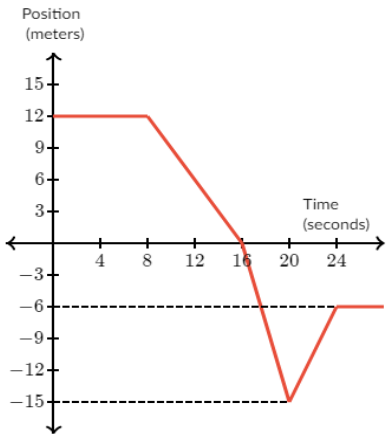
اسم الطالب: رقم الشعبة

Exercise Chapter 2: motion in 1 D (part 1)

1- A pig runs **rightward 20m** and then walks **5m leftward**. Finally it walks **25m** again **leftward**. **Find the distance and displacement.** { note: **rightward is (+)** and **leftward is (-)** }

a) Distance x = -25 m, displacement Δx= -10 m
b) Distance x = 50 m, displacement Δx = -10 m
c) Distance x = +25 m, displacement Δx = -25 m
d) Distance x = 50 m, displacement Δx = -25 m

2- From the graph find the **displacement** between **8s and 24s**?

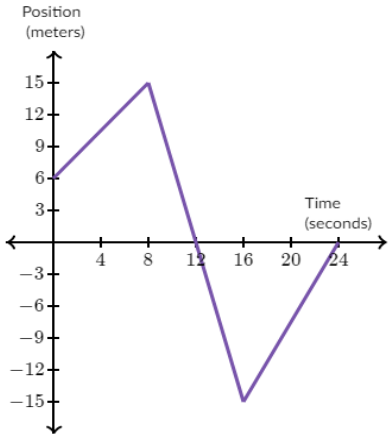


a) -18 m
b) 27 m
c) 25 m
d) -25 m

Find the **distance** between **8s and 24s**?

a) -27 m
b) 36 m
c) 25 m
d) -25 m

3- From the graph find the **displacement** between **12s and 24s**?

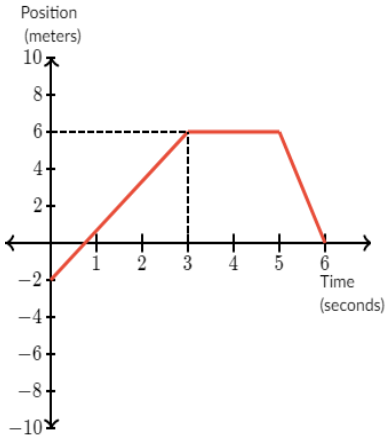


a) 30 m
b) 20 m
c) 0 m
d) 15 m

Find the **distance** between **12s and 24s**?

a) 0 m
b) 20 m
c) 54 m
d) 12 m

4- From the graph find the **displacement** between **0s and 6s**?



a) 3 m
b) 2 m
c) 0 m
d) 1 m

Find the **distance** between **0s and 6s**?

a) 14 m
b) 12 m
c) 2 m
d) 1 m

5- A rabbit runs **rightward 30m** and then walks **15m leftward**. Finally it walks **5m** again **leftward**. **Find the average velocity at time 300s.** { note: **rightward is (+)** and **leftward is (-)** }

a) 0.03 m/s
b) 0.16 m/s
c) -0.16 m/s
d) 6 m/s

6- Megan walks **1100m** to the **left** in **330s**. **Find the speed**?

a) 3.3 m/s
b) 0.3 m/s
c) 33 m/s
d) 66 m/s

7- An alligator crawls **25m**, to the **left** with an **average velocity of -1.2 m/s**. **Find the time**?

a) 30s
b) 10s
c) 20.8s
d) 15s

8- Races are **timed** to an accuracy of **0.001s**. **What distance** could a person rollerblading at a **speed of 8.5 m/s** travel in that period of time?:

a) 85 mm
b) 85 cm
c) 8.5 m
d) 8.5 mm

9- Lebron bikes **800m** to the **left** in 25s. Find the **average velocity**?

a) 12 m/s
b) -32 m/s
c) -23 m/s
d) 55 m/s

10- An object moves along the x axis according to the equation **$x(t) = (3.00t^2 - 2.00t + 3.00)$** m. Determine

1- the position at t = 2.00s	**2- the velocity at t =2.00s**	**3- the acceleration at t = 2.00s**
a) 11 m	a) -21 m	a) 10 m
b) 5.5 m	b) 5.5 m	b) 5.5 m
c) -5.5 m	c) -4.5 m	c) 6 m
d) 13 m	d) 10 m	d) 12 m

Answer

Exercise Chapter 3: Newton's Laws (part 1)

1- Which of following forces are **contact** and which are **field**

a- Electric force (**field**)
b- Magnetic force (**field**)
c- Tensile force (**contact**)
d- Gravitational force (**field**)
e- Pulling spring (**contact**)

2- Which of the following statements represent **Newton's first law**, **Newton's second law** and **Newton's third law** :

a- $\sum F = ma$ (**Newton's second law**)
b- $\sum F = 0$ (**Newton's first law**)
c- $\sum F = mg$ (**Newton's second law**)
d- $F_{12} = - F_{21}$ (**Newton's third law**)

a- According to Newton's _____ law of motion, an object with **less mass** will experience a **greater acceleration** if a constant force is applied to the object.
b- First
c- Second
d- Third
e- Forth

3- If the **net force** exerted on an object **is zero**, this means that,

a- the acceleration of the object is zero
b- its velocity remains constant
c- the object is at rest
d- All of the previous

4- A car moves with **a positive acceleration**, this means that,

a- its velocity increases with time
b- the final velocity is greater than the initial velocity
c- the acceleration and the movement are in the same direction
d- All of the previous

5- A car is traveling with a **constant speed of 20 Km/h**, then the resultant **force acting on it** will be:

a- 200 N
b- 2 N
c- 0 N
d- 20 N

Constant speed means a = 0

F = m .a = m . (0) = 0 N

6- **Force** that produces an **acceleration** of **1 m/s²** in a body of **mass of 1 kg** equal to

a- 3 N
b- 0 N
c- 1 N
d- 2 N

F = m.a

= (1 kg) . (1 m/s^2) = 1 N

7- The **gravitational force** acting on a body with **mass 10 Kg** on **Jupiter** planet (g_J **= 25m/s²**), is:

a- 250 N
b- 25 N
c- 2.5 N
d- 0.25 N

$F = m.g$

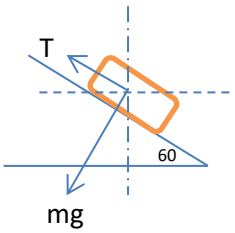
$= (10\ kg) . (25\ m/s^2) = 250\ N$

8- A cord holds stationary a block of mass **m = 10 kg** on a **frictionless** plane that is inclined **θ = 60°**, the **tension in the cord T** equals (**g= 9.8 m/s²**)

a- **84.8 N**
b- 88.3 N
c- 90.2 N
d- 98.6 N

$T = m.g \cos \theta$

$= (10\ kg) . (29.8\ m/s^2) \cos 30 = 84.4\ N$



9- The **friction force** exerting on any travelling care **has a direction**:

a- opposite to the motion direction of the car
b- same as the motion direction of the car
c- perpendicular to the motion direction of the car downward
d- perpendicular to the motion direction of the car upward

10- The maximum **force of a static friction** between an object and a surface **depends on**:

a- the normal force acting on the object
b- the weight of the object
c- the area of the contact surface
d- a and b

11- A car travels on a road with **coefficient of static friction μ_s=0.2**, the **acceleration** with which the car will be stopped = : (**g=10 m/s²**)

a- - 2m/s²
b- -1m/s²
c- -6m/s²
d- -3m/s²

$f_s = \mu_s . n$

$m.a = \mu_s . m. g \longrightarrow a = \dfrac{\mu_s . m. g}{m} = \mu_s . g = (0.2)(10) = -2\ m/s^2$

12- If the force of **kinetic friction** acting on a car was **100 N** and the **weight** of the car is **1000 N**, then **the coefficient of kinetic friction (μ_k)** between the car and the road =

a- 0.1
b- 0.6
c- 0.03
d- 0.05

$f_k = \mu_k . n$

$f_k = \mu_s . F_g \longrightarrow \mu_k = \dfrac{f_k}{F_g} = \dfrac{100}{1000} = 0.1$

Answer

Exercise Chapter 3: Newton's Laws (part 2)

Put (T) at the right sentences and (F) at the wrong sentences

1- If the net force exerted on an object is zero, the acceleration of the object is zero (✓)

2- It is possible for an object to have motion in the absence of forces on the object (✓)

3- Mass and weight are two different quantities (✓)

4- The acceleration of an object is directly proportional to the force acting on it. (✓)

5- The magnitude of the acceleration of an object is inversely proportional to its mass. (✓)

6- The gravitational force acting on a body is the weight of the body (✓)

7- In case of a TV on a table, the action and reaction forces are in opposite directions (✓)

8- For anybody at rest, $\sum F = ma$ (×)

9- The coefficient of static friction and the coefficient of kinetic friction between any two surfaces have the same values (×)

10- The maximum force of static friction between an object and a surface is proportional to the normal force acting on the object. (✓)

11- The friction force acting on a moving car is at the same direction of the motion (×)