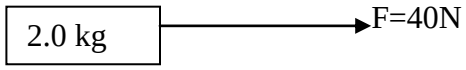
Forces Study Guide/Homework

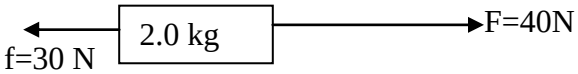
An object accelerates when either the _____ and/or _____ of the velocity change.

Newton's 2nd Law states that the net force acting on an object equals its mass times its acceleration. Fnet=m a. Force is measured in Newtons, mass in kilograms, and acceleration in m/s/s ([meters per second] per second)

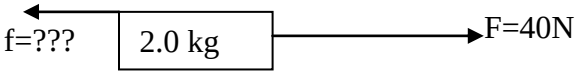
a=_____



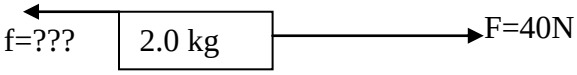
a= _____



a=0.0 f= _____



a=15.0 m/s/s f= _____



Typically, the vertical pressure gradient force is balanced out by the force of _____.

The pressure gradient force is directed from _____ to _____ _ Pressure.

a. High, high b. high, low c. low, low d. low , high

For a given wind speed, the coriolis force is **Larger/Smaller** at high latitudes compared to low latitudes.

For a given latitude the coriolis force is **larger/smaller** for high wind speeds compared to low wind speeds.

The coriolis force is always zero at the _____

For a given wind speed the coriolis force is maximum at _____

a. The poles b. the equator c. 45 degrees Latitude

If the rotational speed of the earth were to decrease the coriolis force would **Decrease/Increase**.

The coriolis force on an object is zero when (circle all that apply)

a. its speed is zero
b. it is at the poles
c. it is at the equator
d. the planet is not rotating

Rank each from smallest to largest coriolis force. Smallest _____ _____ _____ _____ Largest

a. speed 30 mi/hr at 35°N
b. speed 10 mi/hr at 40°N
c. speed 20 mi/hr at 40°N
d. speed 20 mi/hr at 5°N

The coriolis force deflects moving objects to the _____ in the Northern Hemisphere and to the _____ in the Southern Hemisphere.

When the wind speed is 40 mi/hr at a particular location the coriolis force just balances the pressure gradient force. What is the resulting acceleration of the wind?

When air flows in a circular path the net force on the air is directed

e. Zero
f. Inward
g. Outward
h. Forward
i. backward

What is the direction of the friction force if the wind is blowing 20 mi/hr towards the NE

a. SE
b. SW
c. NW

NE

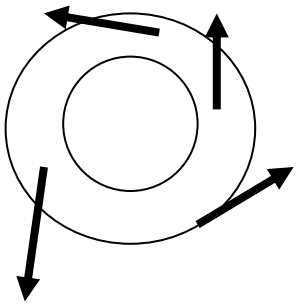
Friction always acts _____ relative to wind velocity.

Friction tends to make the wind blow **faster/Slower** .

Friction tends to indirectly **increase/decrease** the coriolis force.

The friction force indirectly tends to make the wind blow in the direction tilted **towards / away from** the pressure gradient force.

For the Figure below does the wind flow pattern match circulation for a
NH Low, NH High, SH Low, or SH High?



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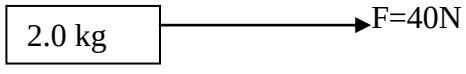
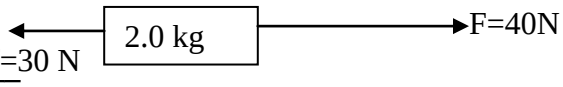
An object accelerates when either the __**Speed**_____ and/or ____**direction**_____ of the velocity change.

Newton's 2nd Law states that the net force acting on an object equals its mass times its acceleration. Fnet=m a. Force is measured in Newtons, mass in kilograms, and acceleration in m/s/s ([meters per second] per second)

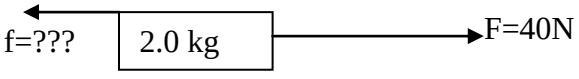
a=__20 m/s/s____



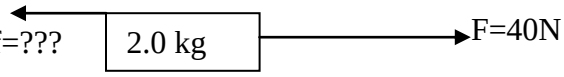
a= __5 m/s/s____



a=0.0 f= __40 N_____



a=15.0 m/s/s **f= __10 N_____**



Typically, the vertical pressure gradient force is balanced out by the force of ____**gravity (this is hydrostatic balance)_____.**

The pressure gradient force is directed from _____ to _____ _ Pressure.

a. High, high **b. high, low** c. low, low d. low , high

For a given wind speed, the coriolis force is **Larger/Smaller** at high latitudes compared to low latitudes.

For a given latitude the coriolis force is **larger/smaller** for high wind speeds compared to low wind speeds.

The coriolis force is always zero at the ___**Equator**_____

For a given wind speed the coriolis force is maximum at _____

a. **The poles** b. the equator c. 45 degrees Latitude

If the rotational speed of the earth were to decrease the coriolis force would **Decrease/Increase**.

The coriolis force on an object is zero when (circle all that apply)

j. its speed is zero
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Rank each from smallest to largest coriolis force. Smallest __**d**____ __**b**____ ___**c**____ __**a**_____ Largest

e. speed 30 mi/hr at 35°N
f. speed 10 mi/hr at 40°N
g. speed 20 mi/hr at 40°N
h. speed 20 mi/hr at 5°N

The coriolis force deflects moving objects to the ___**Right**_____ in the Northern Hemisphere and to the _____**Left**_____ in the Southern Hemisphere.

When the wind speed is 40 mi/hr at a particular location the coriolis force just balances the pressure gradient force. What is the resulting acceleration of the wind? **zero**

When air flows in a circular path the net force on the air is directed

n. Zero
o. Inward
p. Outward
q. Forward
r. backward

What is the direction of the friction force if the wind is blowing 20 mi/hr towards the NE

d. SE
e. SW
f. NW
NE

Friction always acts ___**opposite**_____ relative to wind velocity.

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NH Low, NH High, SH Low, or **SH High**?