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QUESTION 1



You are standing on the side of the road and this bus moves past you. Find the labels that best describe the situation from your point of view.

☒ subject	☒ speed reference frame	☒ object reference frame	☒ object ✓
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QUESTION 2



☒ ground reference frame ✓	☒ moving reference frame ✓
--	--

You are standing on the bank of a river, watching a salmon swim up-stream. The river has a velocity of 1.6 m/s east relative to the ground, and the salmon has a velocity of 3.1 m/s relative to the river. The salmon's velocity relative to you

is ✓ ▼.

QUESTION 3



You are standing on the side of the road watching your friend walk to the back of a bus.

Your friend is moving at 1 m/s to the right. The bus is moving at 2 m/s to the left.

Your friend's velocity relative to you is

1 ✓	m to the
left ✓	



QUESTION 4



Two runners, A and B are running in the park. Runner A has a velocity of 1.2 m/s north and runner B has a velocity of 0.9 m/s south. Their relative speed is m/s.

QUESTION 5



A walkway is moving at 1 m/s to the right. Aisha and Khadija are standing at the end of the walkway. Aisha runs the wrong way along the walkway at 1.6 m/s. Khadija races her and runs on the floor alongside the walkway at 1.6 m/s.

Khadija's velocity relative to Aisha is to the left.

QUESTION 6



You are standing on the ground floor of a mall and watching this person moving with 0.3 m/s down on a 0.7 m/s downward escalator. Then the velocity of the man relative to you is:



☒ 1.0 m/s toward you



☐ 0.3 m/s toward you

☐ 0.7 m/s away from you

☐ 0.7 m/s toward you

QUESTION 7



Select the fixed reference frames in these images.

☐

merry-go-round



highway

☐

sea currents





pool



plane



river

QUESTION 8



You (Y) are observing this ship (S) from the shore. It is moving toward you. You notice a boy (B) walking from the front of the ship toward the back. Describe the equation that best describes the motion of the boy relative to you.



$$v_{B/S} = v_{B/Y} + v_{S/Y}$$

$$v_{B/Y} = v_{B/S} + v_{S/Y}$$



☐ $v_{B/Y} = v_{Y/B} + v_{S/Y}$

☐ $v_{Y/B} = v_{Y/S} + v_{B/Y}$

QUESTION 9



These two cars both have a speed of 100 km/h. The white car is moving west and the black car is moving east. Select the statement that best describes their relative motion.



☐ They are currently moving toward each other at 100 km/h.

☐ They think that they are not moving relative to each other so relative motion is 0 km/h.

☐ They are currently moving away from each other at 100 km/h.

☒ They are currently moving away from each other at 200 km/h.



QUESTION 10



The escalator on the left is moving down and the escalator on the right is moving up at the same speed. Which statement best describes the relative motion of the two escalators?



☐ They are not moving relative to each other so relative motion is 0 km/h.

☒ They are moving at twice the speed relative to each other. ✓

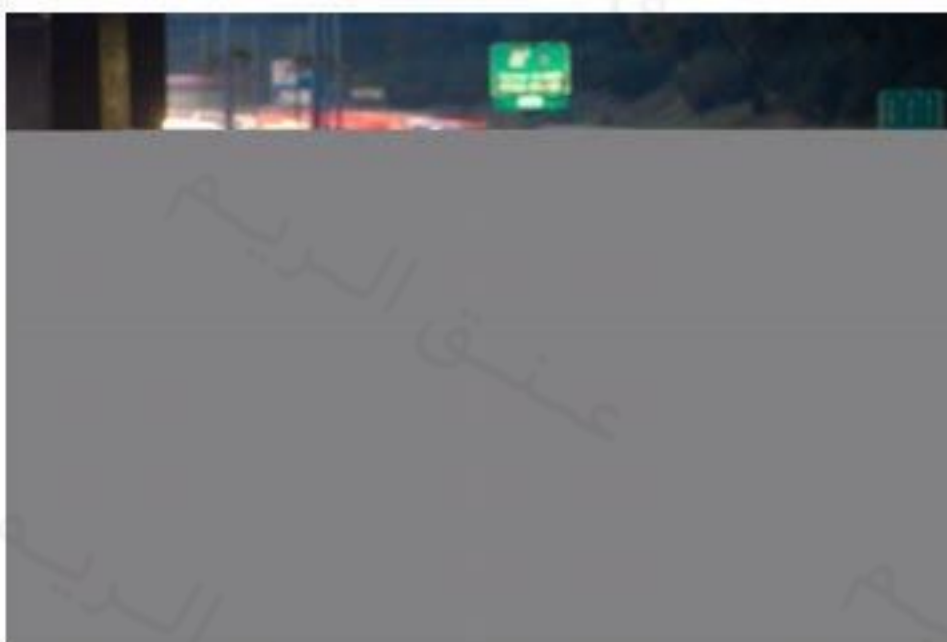
☐ They are moving at half the speed relative to each other.

☐ They are moving at zero velocity relative to each other.

QUESTION 11



Select the example of a moving reference frame out of these options.



highway

☐

mountain

☐

plane

☐

pool

QUESTION 12



You are standing on the bank of a river, watching a swimmer swim down-stream. The river has a velocity of 0.6 m/s east relative to the ground and the swimmer has a velocity of 1.1 m/s relative to the river. What is the swimmer's velocity relative to you?

☐

1.6 m/s east

☐

0.4 m/s west

1.7 m/s east



☐ 0.5 m/s west

QUESTION 13



You are standing on the sidewalk, watching someone walk to the back of the bus as the bus moves forward. What is the best description of your reference frame?



☐ Objective reference frame.

☐ Moving reference frame.

☐ Rotating reference frame.

☒ Ground reference frame.



QUESTION 14



You are looking at a man walking down an escalator from the ground floor of a mall. Choose the answer that best describes the situation from where you are standing.



The man is the object.
The escalator is the moving reference frame.
You are at the ground reference frame.



The man is at the ground reference frame.
The escalator is the object.
You are the moving reference frame.



The man is the moving reference frame.
The escalator is the object.
You are at the ground reference frame.



The man is the object.
The escalator is the ground reference frame.
You are at the moving reference frame.

QUESTION 15



A reference frame is a(n) **coordinate system** that you view motion from.

QUESTION 16



A(n)

reference frame ✓ ▼

is a coordinate system that you view motion from.