Consider a S' frame moving with a speed v in 1D with respect to a stationary frame S. Using your everyday intuition, write down the relationship between a position measurement x and x'.

Be ready to explain why this makes sense to you.

The Galilean transformation between S' and S is:

$$x = x' + vt$$

The Lorentz transformation will introduce a γ, where do you think it goes? And why?

I'm in frame S, and you are in is in Frame S', which moves with speed V in the $+x$ direction.

An object moves in the S' frame in the $+x$ direction with speed v_x'. Do I measure its x component of velocity to be $v_x = v_x'$?

A. Yes

B. No

C. ???

I'm in frame S, and you are in is in Frame S', which moves with speed V in the $+x$ direction.

An object moves in the S' frame in the $+y$ direction with speed v_y'. Do I measure its y component of velocity to be $v_y = v_y'$?

A. Yes

B. No

C. ???

With Einstein's velocity addition rule,

$$u = \frac{u' + v}{1 + \frac{u'v}{c^2}}$$

what happens when v is very small compared to c?

A. $u \rightarrow 0$

B. $u \rightarrow c$

C. $u \rightarrow \infty$

D. $u \approx u' + v$

E. Something else

With Einstein's velocity addition rule,

$$u = \frac{u' + v}{1 + \frac{u'v}{c^2}}$$

what happens when u' is c?

A. $u \to 0$

B. $u \to c$

C. $u \to \infty$

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E. Something else

True or False: The dot product (in 3 space) is invariant to rotations.

$$\mathbf{a} \cdot \mathbf{b} \equiv a_\mu b^\mu$$

A. True

B. False

C. No idea

I have seen the Eisntein summation notation before:

$$\mathbf{a} \cdot \mathbf{b} \equiv a_\mu b^\mu$$

A. Yes and I'm comfortable with it
B. Yes, but I'm just a little rusty with it
C. Yes, but I don't remember it it all
D. Nope

Displacement is a defined quantity

$$\Delta x^{\mu} \equiv \left(x_A^{\mu} - x_B^{\mu}\right)$$

Is the displacement a contravariant 4-vector?

A. Yes
B. No
C. Umm...don't know how to tell
D. None of these.

Be ready to explain your answer.

The displacement between two events Δx^{μ} is a contravariant 4-vector.

Is $5\Delta x^{\mu}$ also a 4-vector?

A. Yes

B. No

The displacement between two events Δx^μ is a contravariant 4-vector.

Is $\Delta x^\mu / \Delta t$ also a 4-vector (where Δt is the time between in events in some frame)?

A. Yes

B. No

The displacement between two events Δx^{μ} is a contravariant 4-vector.

Is $\Delta x^{\mu}/\Delta\tau$ also a 4-vector (where $\Delta\tau$ is the proper time)?

A. Yes
B. No