Q 6.

Imagine a horse pulling a buggy. Which is correct?

1. **If action always equals reaction, a horse cannot pull a buggy because the action of the horse on the buggy is exactly cancelled by the reaction of the buggy on the horse. The buggy pulls backward just as hard as the horse pulls forward on the buggy so they cannot move.**

2. **The horse pulls forward slightly harder on the buggy than the buggy pulls backward on the horse, so they move forward.**

3. **The horse pulls before the buggy has time to react, so they move forward.**

4. **The horse can pull the buggy forward only if the horse weighs more than the buggy.**

5. **The force on the buggy is as strong as the force on the horse, but the horse is joined to the earth by its flat hoofs, while the buggy is free to roll on its round wheels.**

Q 7.

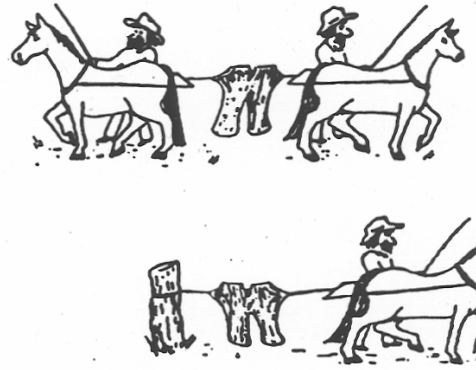
The Levi Strauss trademark shows two horses trying to pull apart a pair of pants. Suppose Levi had only one horse and attached the other side of the pants to a fencepost.

Using only one horse would:

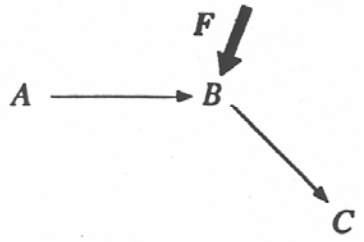
1. cut the tension on the pants by one-half

2. not change the tension at all

3. double the tension on the pants



Q 8. An object with a known mass, say one kilogram, is moving from *A* to *B* with a known speed, say one meter per second. At *B* a force acts on the object. The force does not change the object's speed, but does change its direction of motion by 45 degrees. Is it theoretically possible to calculate how strong the force was?



1. Yes, the strength of the force can be calculated (though I might not know how to do the calculation)

2. No, the force cannot be calculated by anyone without more information.

Answers

Q6. 5
Q7. 2
Q8. 2*

* The force *F=ma* could be calculated if the acceleration *a* were known, since the mass *m* is given. But the change in velocity equals the acceleration times the time it acts, and the time over which the force acts is not specified.