OSU Academic Integrity Statement

During this quiz you are not to receive information, nor communicate with anyone, about the form, content, length, or difficulty of this quiz. Additionally, you are not to use any unauthorized resources while taking this quiz.

The allowed resources are: any notes you have collected during this course (handwritten, printed, or saved locally on your computer), blank sheets of paper or a digital tablet, writing utensil, a ruler, a protractor, and a non-communicating calculator. **Accessing the internet** while taking the quiz for any reason other than downloading, viewing, or turning in the quiz **is strictly prohibited**.

Receiving information or discussing details about this quiz between the time of its release and a time 48 hours later is stickily prohibited and is in violation of Oregon State University's Code of Student Conduct.

https://studentlife.oregonstate.edu/studentconduct/academicmisconduct

Any incidence of academic misconduct will be dealt with in accordance with Oregon State University's policies.

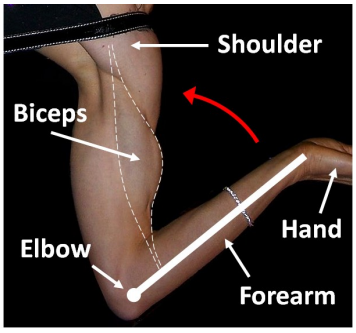
By submitting your work to Gradescope, you are stating that you have abided and will abide by the rules stated here and the academic integrity statement found in the syllabus on boxsand.org.

Physics 202

Weekly 3 quiz | Corvallis Campus

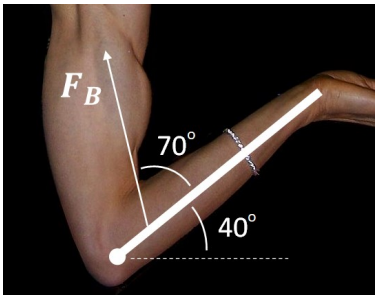
1/20/2020

Collaboration is not allowed. You will have 30 minutes to download this PDF, solve, take pictures, AND upload this exam to Gradescope.



The biceps brachii (commonly known as biceps) muscles are responsible for bending your arm at the elbow. They move your forearm towards your shoulder (the red arrow shows this motion, also known as adduction). See diagram at right. Your biceps muscles attach to your forearm a few cm away from your elbow.

(a) Using relevant physical concepts we have discussed this term, explain why the biceps muscles do not attach directly to the elbow, but instead attach to the forearm a few centimeters away from the elbow. Use words, diagrams, graphs, etc!



(b) While lifting a rock, Elle Beau's biceps make an angle of 70 degrees with her forearm, and her forearm makes an angle of 40 degrees with the horizontal as shown to the right. The distance from Elle's elbow to her hand is 26.7 cm, and her biceps attach to her forearm 3.4 cm away from her elbow. Elle's forearm has a mass of 1.46 kg, and a center of mass midway between her elbow and her hand. If she is holding the 5 kg rock stationary in her hand, how much force are her biceps exerting on her forearm? (assume no other muscles are exerting forces)