



Welcome back, Bill Wiecking

>>Working in AP Physics B (SC651)

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## ch 4 conceptual

### Chapter 4: Motion in Two and Three Dimensions

#### Conceptual problems

**4.C.1** How can you change only one component of the velocity without changing the speed? **(5.00)**

**4.C.2** Two girls decide to jump off a diving board. Katherine steps off the diving board. Anna runs straight off the diving board so that her initial velocity is solely horizontal. They both leave the diving board at the same time. Which one lands in the water first? **(5.00)**

**4.C.3** An astronaut throws a baseball horizontally with the same initial velocity: once on the Earth, and once on the Moon. Where does the ball travel farther? Explain your answer. **(5.00)**



**4.C.4** What is the name for the shape of a projectile's path? **(5.00)**

**4.C.5** Sarah is standing on the east bank of a river that runs south to north, and she wants to meet her friends who are on a boat in the middle of the river, directly west of her. Her friends point the boat east, directly at her, and then turn on the motor. The boat stays pointed east throughout its journey. (a) At what speed should Sarah walk or run along the bank of the river in order for her to meet the boat when it touches the bank? (b) In what direction should she

move? (c) Does either answer depend on the speed of the boat relative to the water, which is provided by the motor?

(a)

(b)

(c)  Yes  No

**4.C.6** Two students, Jim and Sarah, are walking to different classrooms from the same cafeteria. How does Jim's velocity in Sarah's reference frame relate to Sarah's velocity in Jim's reference frame?

**(7.00)**

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