Preparation sheet for Test 1

Problems on this Test will be based on the homework problems listed below.

Note 1: You should check the original homework assignment for Hints or Notes for any of the problems listed below with an asterisk (e.g., 2^*). Some problems have more than one Hint or Note, so make sure to *find and use all of them*.
Note 2: If an even-numbered problem does not have an answer listed on the homework webpage, then it must be a WebAssign problem, and the answer should be found there.
Note 3: A problem on the Test may combine concepts of more than one problems listed on this sheet, or it may use only part of the solution of a given homework problem.
Note 4: Groups of problems from the same section that may pertain to different test problems are separated by a space.

When preparing for the Test, it will be beneficial for your performance if you **redo** the problems listed below, and also review the related examples in the notes and in the book. Please **note**: It will **not help you much** if you simply browse those problems **without actually doing them**.

On this Test, use of calculators will be allowed.
You may also prepare and use one double-sided sheet with formulae.

1. Sec. 12.3: ## 40^*, 41^*, 46^*. For # 46, focus on the sketch rather than on the calculation (i.e., you need to know the relative position of the four vectors, but *not* how to compute $\mathbf{orth_a b}$).
2. Sec. 13.1: ## 8^*, 7^*; 39, 40; and # 6(a)* on p. 928 of the e-book.
3. Sec. 13.2: ## 3(a)*, 5(a)*; 13^*, 14^*, 19; 25^*, 27^*, 28^*.
4. Sec. 13.3: ## 20^*, 24^*, 25; 37, and also # 12^* on p. 928 of the e-book. You must also review Ex. 2 in the notes for this section (this example was about curvature of an ellipse and about related osculating circles). For ## 20(a) and 24(a), you do **not** need to compute $\vec{N}$. However, pay good attention to all of the notes for ## 20(b) and 24(b) on the Homework website.

   Technical note:
   Part of a test problem may involve computing a cross product of vectors lying in one of the coordinate planes (i.e., xy-, yz-, or zx-plane). Some WebAssign tutorials or solutions may show you a shortcut for such a calculation, which involves only a 2×2 determinant. However, I require that on this test, **you compute any cross product using its original definition with a 3×3 determinant.** I will penalize solutions that will use a 2×2 shortcut.
5. Sec. 13.4: ## 3^*, 5^*, 6^*; 43^*; # 8(b)* on p. 927 of e-book; and both Word Problems*.
   Please note: Make sure you read the comments posted for these problems on the homework webpage and do what they say. Also, however simple Fig. 7 in Sec. 13.4 may seem, in the past I have seen a great many mistakes related to it. So make sure you understand what it shows. If you are asked to produce a similar picture, you must make it *crystal-clear* how the tangential and normal components of acceleration are related to the acceleration vector, as well as how they are oriented relative to one another.
   On the test, you will be asked to find the components of the acceleration vector *from a sketch* rather than from a formula.