Due by 2359 (11:59 PM) on Sunday January 19. Hand in via Gradescope.

For problem 0, credit is awarded for any honest response, not for the amount of work undertaken.

For problems 1, 2 and 3, you must give a fully written-out solution showing all your working and justification. Stating the correct answer, by itself, will earn no credit.

0. Do the following textbook problems. Do not turn them in, but provide a list here of those for which you wrote down solutions.

§1.2: 1, 3, 9, 13, 15, 23, 29 (1 points)

1. Three points $A$, $B$, $C$ in 3D space have corresponding position vectors
\[ \vec{a} = (1, 2, 7) \]
\[ \vec{b} = (3, -1, -2) \]
\[ \vec{c} = (-2, 0, 9) \]

Compute all three of the angles in the triangle $ABC$. (6 points)

2. The infinite straight line $L$ passes through the points $(3, 2, 1)$ and $(7, 6, 5)$. The point $A$ is at $(1, -2, 13)$. Find:
   - the closest point on $L$ to $A$; and
   - the distance from $A$ to that point.
   [Hint: The formula for orthogonal projection may be useful for this question. However, you have to be careful what you apply it to, because the line $L$ does not go through $(0, 0, 0)$ as it did in lectures.]

(6 points)

3. Find a vector $\vec{v} = (x, y, z)$ that is orthogonal to both $(1, 2, 3)$ and $(-2, 1, 0)$, and has length 1.

(6 points)