Coverage for Math 200 Common Final Exam, Fall 2015

(1) Chapter 12:
  (a) No problems on counting the number of operations.
  (b) No direction angles or direction cosines (12.3).
  (c) No scalar projection, but its absolute value, which is the magnitude of the vector projection, can be useful.
  (d) No questions on the angle a line makes with a plane (12.5).
  (e) 12.6: You need to know cyclinders, ellipsoids, paraboloids, and spheres. No questions on hyperboliods.

(2) Chapter 14:
  (a) Section 14.2 entirely omitted.
  (b) No problems on Lagrange multipliers involving two constraints.

(3) Chapter 15:
  (a) Sections 15.6 and 15.10 entirely omitted.
  (b) Section 15.5: mass and centre of mass, no questions on momemnts of interia or probability.
  (c) You may be asked to sketch a 2-dimensional region. No questions for points directly for 3-dimensional sketching of regions; but you should be able to specificy limits in 3-dimensional integrals by a combination of manipulating inequalities and sketching.
  (d) Integrals: here are representative examples (not an exhaustive list).
    (i) You should know how to integrate $x^n \, dx$, $\sin\theta \, d\theta$, $\cos\theta \, d\theta$.
    (ii) You should know how to integrate by substitution: e.g., $\sin(10\theta) \, d\theta$, $e^{y^2} 2y \, dy$ (but $e^{y^2} \, dy$ cannot be integrated in terms of commonly used functions). Similarly you should know how to integrate $\sin^n \theta \, \cos\theta \, d\theta$.
    (iii) You should know how to integrate $\cos^2 \alpha \, d\alpha$ using the formula sheet identity $\cos(2\alpha) = 2\cos^2 \alpha - 1$.
    (iv) You should know how to integrate $\cos^3 \alpha$ if we provide a formula expressing this in terms of a combination of $\cos(3\alpha)$ and $\cos(\alpha)$.