

**Note:** These are problems taken from the textbook. They were selected as representatives of each section, but are not a promise of what will be on the exam. They were chosen primarily because they were not homework exercises. We will work through as many as we can during our review, but may not get to all of them.

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Compute the following integrals.

1. (7.1, #29)  $\int \frac{(\ln z)^2}{z} dz$
2. (7.1, #35)  $\int \frac{e^x}{2 + e^x} dx$
3. (7.2, #16)  $\int y\sqrt{y+3} dy$
4. (7.4, #44)  $\int \frac{x+1}{x^3+x} dx$
5. (7.4, #49)  $\int \frac{dz}{(4-z^2)^{3/2}}$
6. (7.4, #51)  $\int \frac{1}{x^2+4x+13} dx$
7. (7.7, #23)  $\int_2^\infty \frac{dx}{x \ln x}$
8. (7.7, #26)  $\int_1^2 \frac{dx}{x \ln x}$

Determine if the following improper integrals converge or diverge.

9. (7.8, #11)  $\int_1^\infty \frac{dx}{1+x}$
10. (7.8, #23)  $\int_0^\infty \frac{dz}{e^z + 2^z}$

Find the area or volume.

11. (8.1, #6) Find the area of the triangle. (See textbook.)
12. (8.1, #14) Find the volume of the pyramid. (See textbook.)
13. (8.2, #7) Find the volume of the solid obtained by rotating about the  $x$ -axis the region bounded by  $y = \frac{1}{x+1}$ ,  $y = 0$ ,  $x = 0$ , and  $x = 1$ .