

Name: \_\_\_\_\_

AP Calculus – Area and Volume Review Problems

For each of the following problems, draw a picture and label all parts of the graph.

Part One: Area between curves – Find the area enclosed by the graphs.

1.  $y = \frac{8}{x^2}$ ,  $y = 8x$ , and  $y = x$ . Ans: 6
2.  $y = x^2$ ,  $y = (x - 2)^2$ , and  $y = 0$ . Ans: 2/3
3.  $f(x) = x^3 - 10x$  and  $g(x) = 6x$ . Ans: 128
4.  $h(y) = y^2 - 1$  and  $g(y) = y^2 - \frac{1}{8}y^4 + 1$ . Ans: 6.4

Part Two: Volume of Revolutions – Find the volume enclosed by the following graphs revolved around the given line.

5.  $y = e^{-x}$ ,  $y = 1 - e^{-x}$ , and  $x = 0$  about the line  $y = 4$ . Ans: 6.7480
6.  $y = e^{-x}$ ,  $y = 1 - e^{-x}$ , and  $x = 0$  about the line  $x = -2$ . Ans: 4.2746(7)
7.  $y = \frac{9}{x^2}$ ,  $y = 10 - x^2$ ,  $x \geq 0$  about the line  $y = 12$ . Ans: 247.9763
8.  $y = -\frac{1}{2}x^3$ ,  $y = 4$ , and  $x = 2$  about the line  $y = 6$ . Ans: 430.8469
9.  $y = e^{-x^2}$ ,  $y = 1 - \cos x$ ,  $y$  – axis about the  $y$  – axis. Ans: 1.2594(5)
10.  $y = e^{-x^2}$ ,  $y = 1 - \cos x$ ,  $y$  – axis about the  $y = 8$ . Ans: 27.9584

