Principles of Calculus Modeling: An Interactive Approach by Donald Kreider, Dwight Lahr, and Susan Diesel
Exercises for Section 4.7

1. (1 pt)
Find the area of the plane region bounded by $f(x) = \sqrt{x}$ and $f(x) = x^2$. It may be useful to make a sketch of the region.
Area = _____ square units

2. (1 pt)
Find the area in the plane bounded by the two parabolas $y = 2x^2 - 80x + 122$ and $y = -4x^2 - 2x - 10$.
Area = _____ square units

3. (1 pt)
What is the area of the region between the parabola $y = -4x^2 - 34x - 70$ and the line $y + 2x = -10$?
Area = ___

A. 2.667 square units
B. 5.333 square units
C. 277.333 square units
D. 64.000 square units
E. -5.333 square units

4. (1 pt)
Find the area in the plane bounded by the two curves $f(x) = 4x^2$ and $g(x) = \dfrac{28}{6x^2+1}$.
Area = _____ square units

5. (1 pt)
Find the area in the plane bounded by the two curves $f(x) = x^3 - 9x^2 + 80x$ and $g(x) = 9x^2 - x$.
Area = _____ square units

6. (1 pt)
Find the area in the plane bounded by the two curves $y = \sqrt{x}$ and $y = 8x$.
Area = _____ square units

7. (1 pt)
Find the area in the plane bounded by the two curves $y = |x|$ and $y = (x+2)^2 - 9$. It may be useful to make a sketch of the region.
Area = _____ square units

8. (1 pt)
Find the area in the plane bounded by the curves $x = y^2$, $y = \dfrac{1}{5}x - 7.2$, $y = -2$, and $y = 7$.
Area = _____ square units

9. (1 pt)
Find the upper portion of the area in the plane bounded by the curves $y = \sqrt{1-x^2}$, $y = 0$, and to the right of $y = 6x + 1$. It may be useful to make a sketch of the region.
Area = _____ square units

10. (1 pt)
Find the area of the region in the plane bounded by the curve $y = \cos(x)$ and the line $y = \dfrac{-1}{8}x + \dfrac{1}{16}\pi$. Since $\cos(x)$ is periodic, only find the region bounded by the line and the curve between $-\dfrac{\pi}{2}$ and $\dfrac{\pi}{2}$. It may be useful to make a sketch of the region. You may use an applet, Maple, or another computer algebra program to find where the curve and the line intersect.
Area = _____ square units

11. (1 pt)
Find the area of the region bounded by the y-axis and the curve with equation $y^2 - 16y + 10x = 0$.
Area = _____

12. (1 pt)
Find the area between the curves $y^2 = 17x$ and $x^2 = 17y$.
Area = _____

13. (1 pt)
Find the area between the curves $y = \cos(x)$ and $y = \sin(x)$ on the interval $[\frac{21\pi}{4}, \frac{25\pi}{4}]$.
Area = _____

14. (1 pt)
Find the area between the curves $x - y = 10$ and $y^2 = 5x$.
Area = _____

15. (1 pt)
Consider the rectangle of width 9, height 81 with lower left corner at the origin. The parabola $y = x^2$ splits this rectangle into lower and upper regions. What is the ratio of the lower region's area to the upper region's area?
Ratio = _____

16. (1 pt)
Consider the rectangle of width 9, height 4 with lower left corner at the origin. The curve $y = \dfrac{4x^{14}}{9^{14}}$ splits this rectangle into upper and lower regions. What is the ratio of the upper region's area to the lower region's area?
Ratio = _____

17. (1 pt)
Find the area between the curves $y = x^2 + 14x + 17$ and $y = x$ over the interval [-36,27].
Area = _____

18. (1 pt)
What is the area of the region bounded by $y = e^x$, $y = 1$, and $x = 10$?
_____

19. (1 pt)
What is the area of the region bounded by the curve $y = \sin(x)$ and the same curve flipped over the x axis, over the interval $[0, 9\pi]$?
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