1. Find the area of the piece of cone swept out when the graph of \( f(x) = 2x - 1 \) between \( x = 1 \) and \( x = 3 \) is revolved about the \( x \)-axis.

2. Find the area of the piece of cone swept out when the graph of \( f(x) = 3 - \frac{x}{2} \) between \( x = 0 \) and \( x = 4 \) is revolved about the \( x \)-axis.

3. Find the area of the piece of paraboloid swept out when the graph of \( f(x) = \sqrt{2x} \) between \( x = 1 \) and \( x = 2 \) is revolved about the \( x \)-axis.

4. Find the area of the piece of paraboloid swept out when the graph of \( f(x) = \sqrt{1 - \frac{x}{2}} \) between \( x = 0 \) and \( x = 2 \) is revolved about the \( x \)-axis.

5. Find the area of the surface swept out when the part of the graph of the cubic \( y = (3x - 2)^3 \) between \( x = \frac{2}{3} \) and \( x = 1 \) is revolved about the \( x \)-axis.

6. Find the area of the surface swept out when the part of the graph of the cubic \( y = \left(1 - \frac{x}{3}\right)^3 \) between \( x = 0 \) and \( x = 3 \) is revolved about the \( x \)-axis.

*7. Find the area swept out when the piece of the graph of \( y = e^{-2x} \) between \( x = 0 \) and \( x = \ln \pi \) is revolved about the \( x \)-axis.
8. Find an integral that equals the area swept out when the graph of \( y = \sin x \)
    between \( x = 0 \) and \( x = \pi \) is revolved about the \( x \)-axis.

9. Find the area swept out when the graph of the hyperbolic cosine (“the cosh”) between \( x = 0 \) and \( x = \ln 3 \) is revolved about the \( x \)-axis.

10. Find the area swept out when the graph of the hypocycloid defined by parametric equations

\[
\begin{aligned}
  x &= \frac{\cos^3 t}{3} \\
  y &= \frac{\sin^3 t}{3}
\end{aligned}
\]

over the interval \( 0 \leq t \leq \frac{\pi}{2} \) is revolved about the \( x \)-axis.

11. Find the area swept out when the graph of the piece of spiral defined by parametric equations

\[
\begin{aligned}
  x &= e^t \cos t \\
  y &= e^t \sin t
\end{aligned}
\]

over the interval \( 0 \leq t \leq \frac{\pi}{2} \) is revolved about the \( x \)-axis.

12. Find the area swept out when the semi-circle defined by parametric equations

\[
\begin{aligned}
  x &= a \cos t \\
  y &= a \sin t
\end{aligned}
\]

over the interval \( -\frac{\pi}{2} \leq t \leq \frac{\pi}{2} \) is revolved about the line \( x = b \), where \( a \leq b \).

13. Find an integral that equals the area swept out when the graph of \( y = \frac{1}{x^5} \)
    between \( x = 2 \) and \( x = 5 \) is revolved about the \( x \)-axis.

14. Find an integral that equals the area swept out when the graph of \( y = \sqrt[3]{x^3} \)
    between \( x = 1 \) and \( x = 5 \) is revolved about the \( x \)-axis.
15. Find the area swept out when the graph of the curve defined by parametric
   equations \( \begin{cases} x = \sin t \\ y = \sinh t \end{cases} \) over the interval \( 0 \leq t \leq 3 \) is revolved about the \( x \)-axis.

16. Find the area swept out when the graph of \( y = e^{2x} \), between \( x = 1 \) and \( x = \ln 4 \),
    is revolved about the \( y \)-axis.

17. Find the area swept out when the graph of the curve defined by the parametric
   equations \( \begin{cases} x = t \cos(t^3) \\ y = t \sin(t^3) \end{cases} \) over the interval \( 0 \leq t \leq \sqrt[3]{\pi} \) is revolved about the \( y \)-axis.

18. Find the area swept out when the half-ellipse defined by parametric
   equations \( \begin{cases} x = 7 \cos t \\ y = 5 \sin t \end{cases} \) over the interval \( -\frac{\pi}{2} \leq t \leq \frac{\pi}{2} \) is revolved about the line \( x = 10 \).

19. Find the area swept out when the piece of curve defined by parametric
   equations \( \begin{cases} x = \arctan t \\ y = te^{-t} \end{cases} \) over the interval \( 0 \leq t \leq \frac{\pi}{3} \) is revolved about the line \( x = \pi \).

20. Find the area swept out when the semi-circle defined by the graph of \( f(x) = \sqrt{a - (x - b)^2} \)
    over the interval \( b - a \leq x \leq b + a \) is revolved about \( y \)-axis. (The result is half a torus!)

21. Find the area swept out when the ellipse defined by parametric equations \( \begin{cases} x = 6 \cos t \\ y = 3 \sin t \end{cases} \) over the
    interval \( 0 \leq t \leq 2\pi \) is revolved about the line \( y = 5 \).