

(b) Write down an integral in terms of x that represents the area between the two curves.

(c) Write down an integral in terms of y that represents the area between the two curves. (You will need to solve for x in the equations $y = x^2$ and $y = \sqrt{x}$.)

3. Let $f(x) = x^2$, and let (a, a^2) be a point on the graph of f .

(a) Find the equation of the line tangent to the graph of f at (a, a^2) .

(b) Sketch the graph, the point, and the tangent line. Shade the region enclosed by the x -axis, the graph, and the tangent line.

(c) If the shaded region has area $\frac{2}{3}$, what is the value of a ?

4. Let $f(x) = \sin x$ and $g(x) = \cos x$ for $x \in [0, \frac{\pi}{2}]$.

(a) Find the points where the graphs of f and g intersect. Sketch the graphs.

(b) Find the area of the region enclosed by the graph of f , the graph of g , and the lines $x = \frac{\pi}{2}$ and $x = 0$.

5. Each set of equations defines some curves. Find the area of the region enclosed by the curves.

(a) $y = \frac{8}{x}$, $y = 2x$, $x = 4$

(b) $x = 3 + y^2$, $x = 2 - y^2$, $y = 1$, $y = -2$

(c) $y = e^{1+2x}$, $y = e^{1-x}$, $x = -2$, $x = 1$

(d) $y = 2x^2 + 10$, $y = 4x + 16$, $x = -2$, $x = 5$

(e) $x = -y^2 + 10$, $x = (y - 2)^2$

(f) $y = xe^{-x^2}$, $y = x + 1$, $x = 2$, $x = 0$