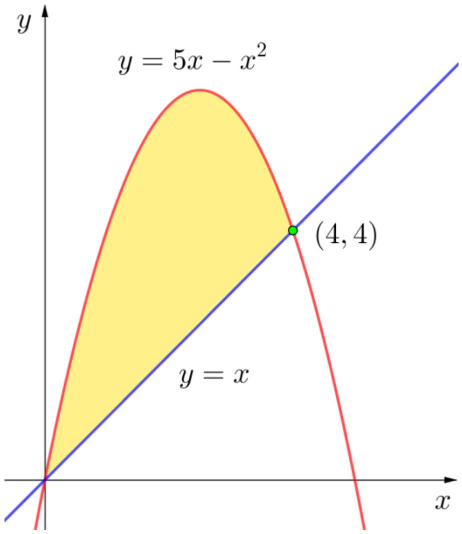
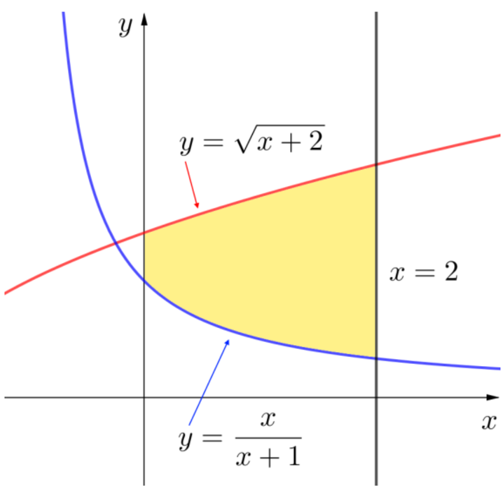
Find the area of the shaded region.

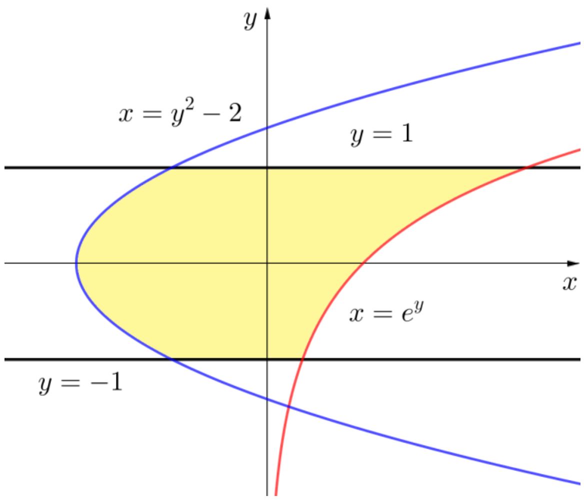
1)



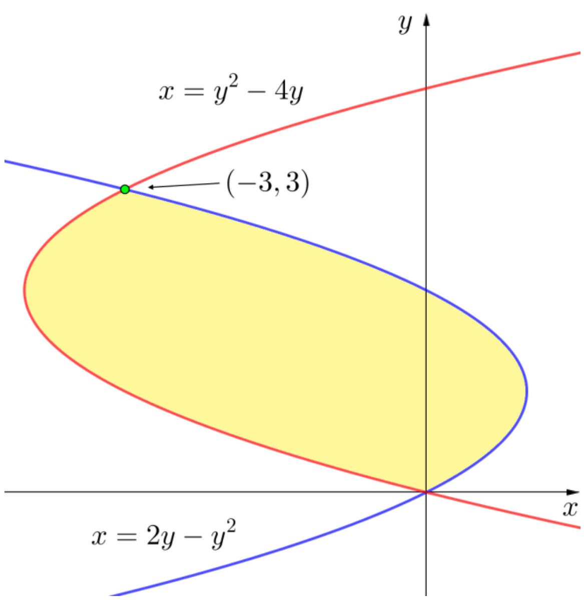
2)



3)

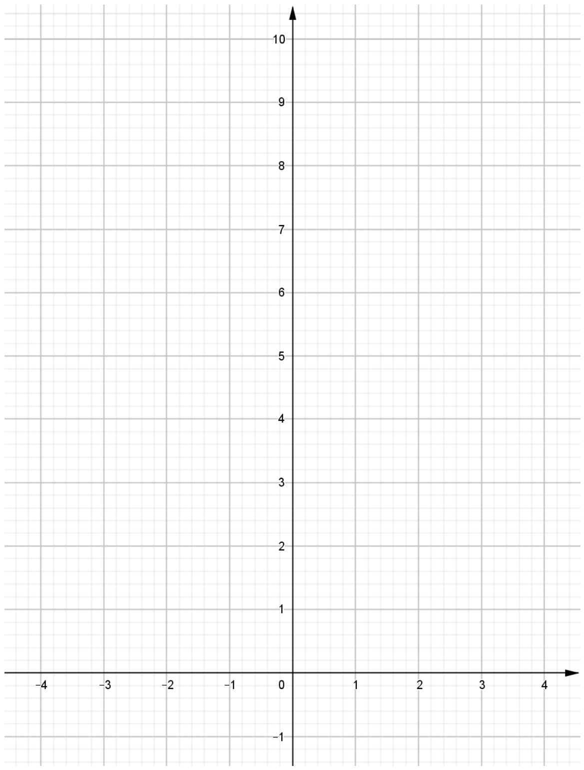


4)

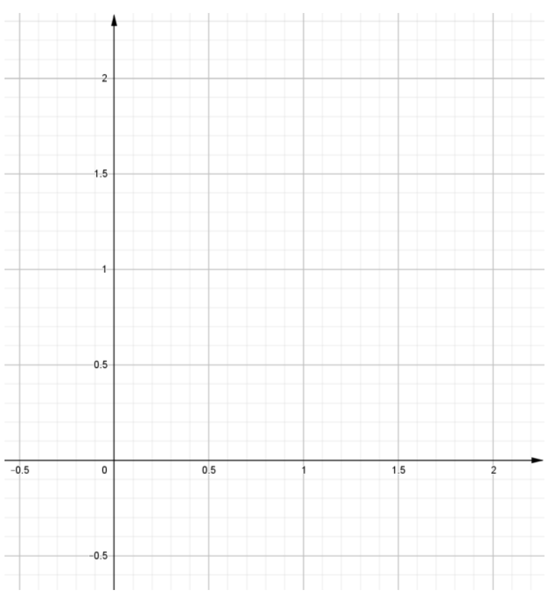


Sketch the region enclosed by the given curves. Decide whether to integrate with respect to x or y. Draw a typical approximating rectangle and label its height and width. Then find the area of the region.

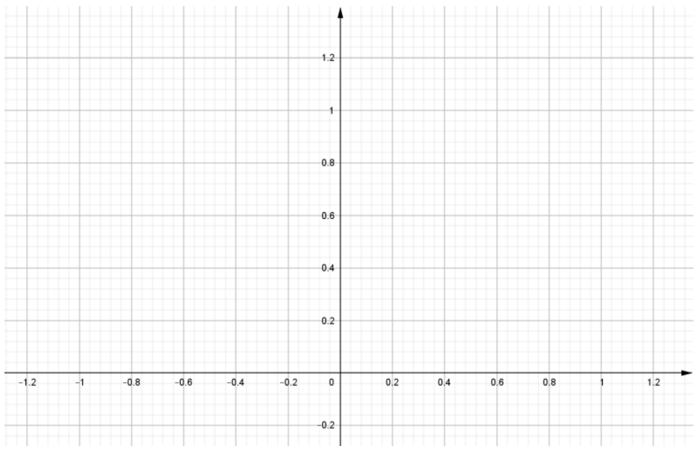
5) $y = x+1, \quad y = 9 - x^2, \quad x = -1, \quad x = 2$



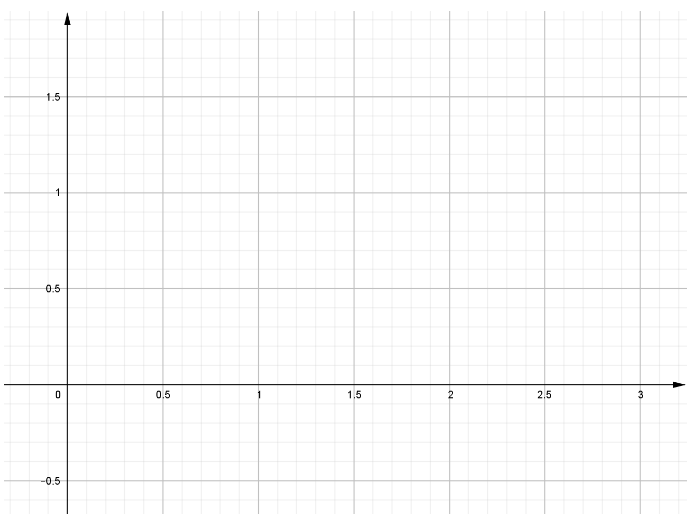
6) $y = x, \quad y = x^2$



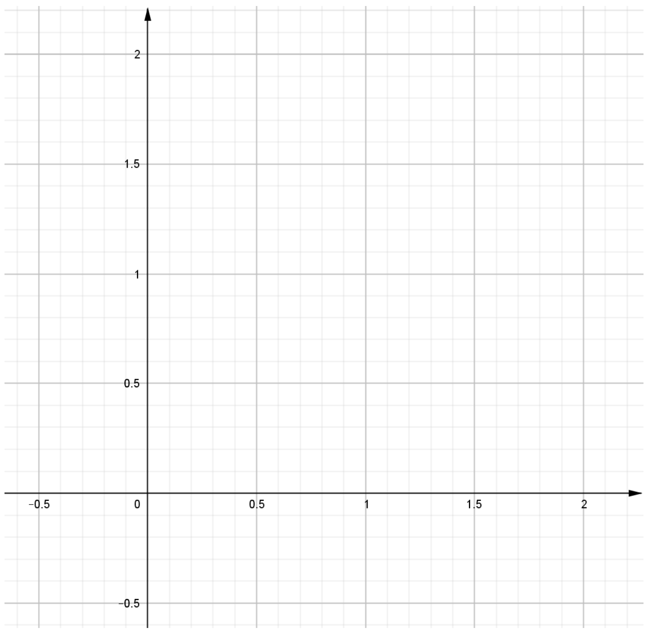
7) $y = x^2, \quad y = x^4$



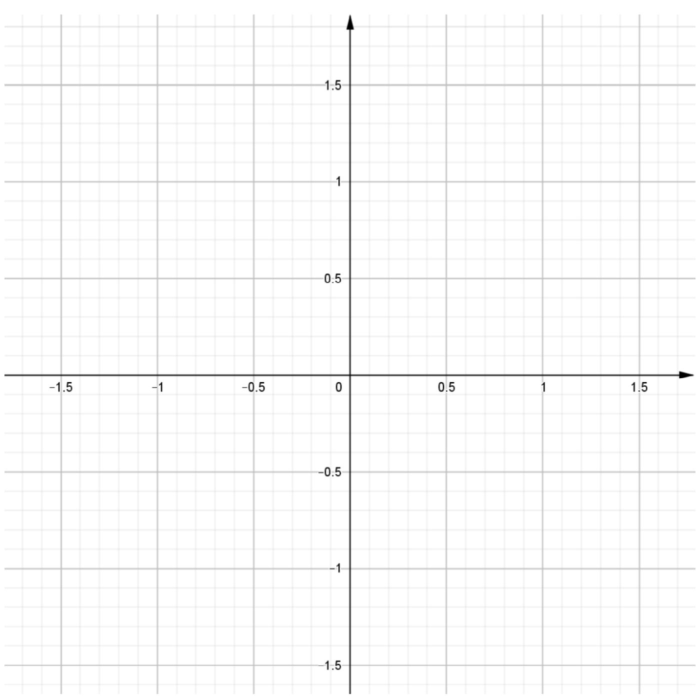
8) $y = \dfrac{1}{x}, \quad y = \dfrac{1}{x^2}, \quad x = 2$



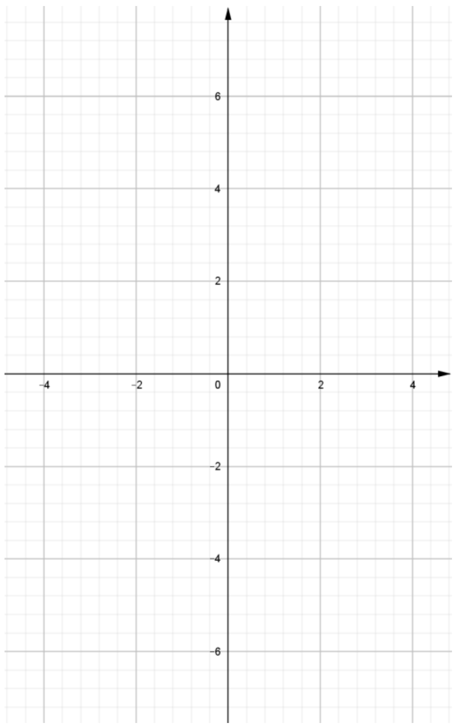
9) $y = x^2, \quad y^2 = x$



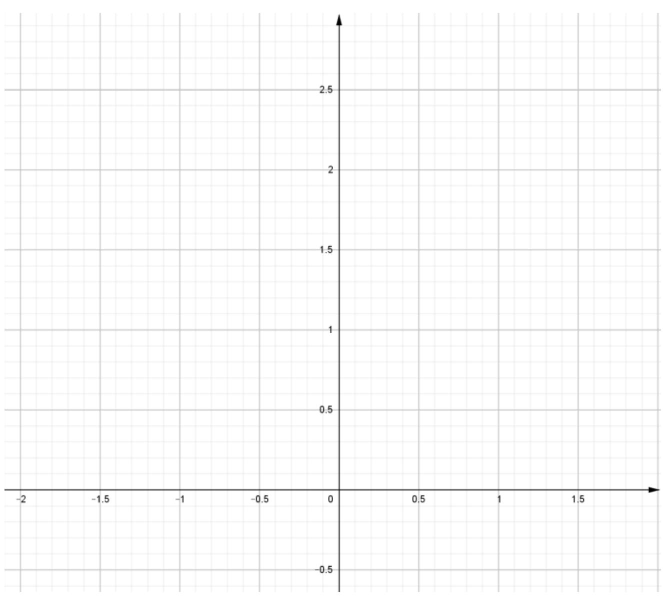
10) $y = x, \quad y = \sqrt[3]{x}$



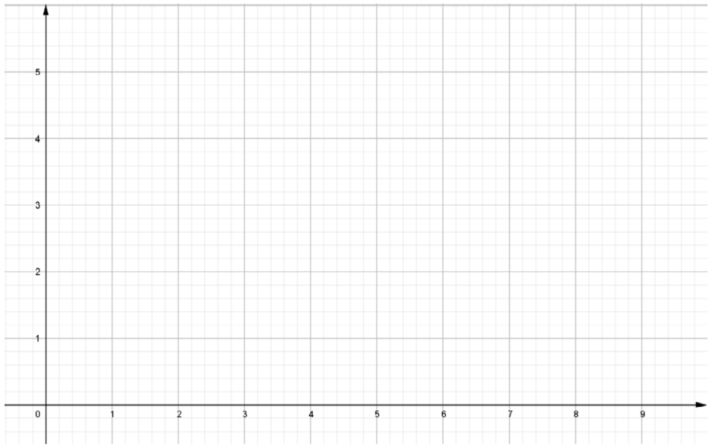
11) $y = x^3 - x, \quad y = 3x$



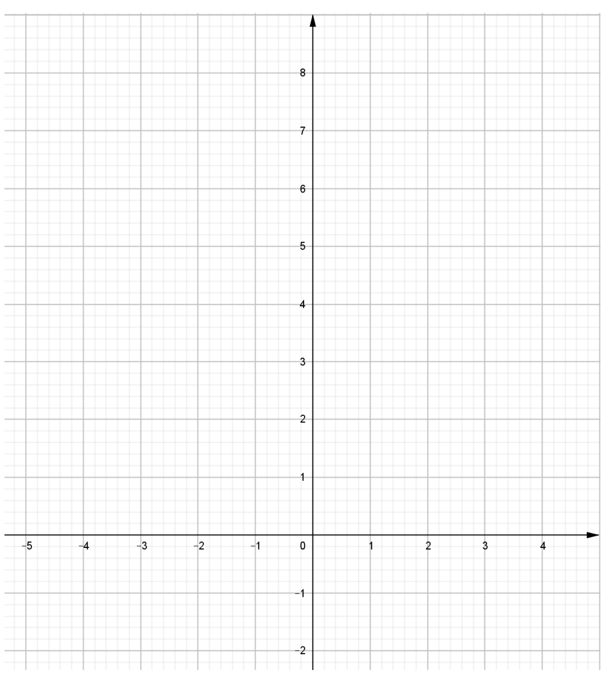
12) $y = x^2, \quad y = \dfrac{2}{x^2+1}$



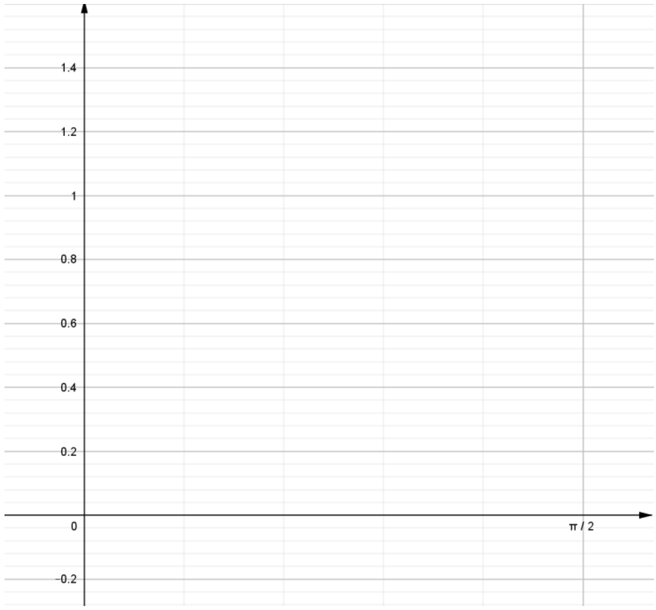
13) $y=\sqrt{x}, \quad y=\frac{1}{2}x, \quad x=9$



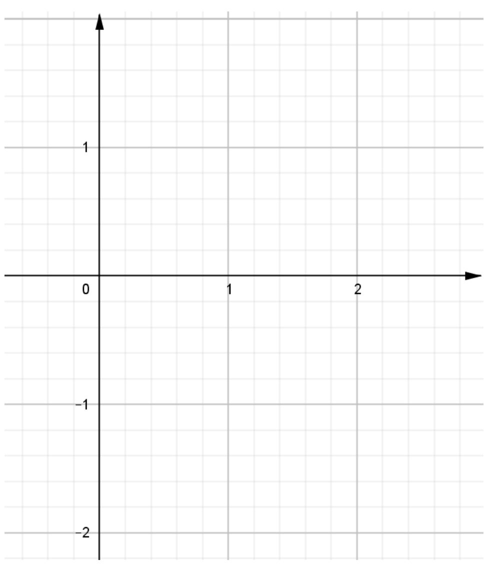
14) $y=8-x^2, \quad y=x^2, \quad x=-3, \quad x=3$



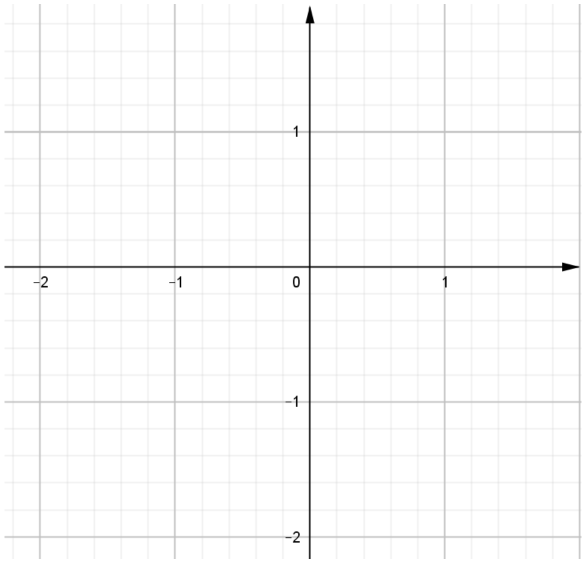
15) $y = \cos x, \quad y = \sin 2x, \quad x = 0, \quad x = \dfrac{\pi}{2}$



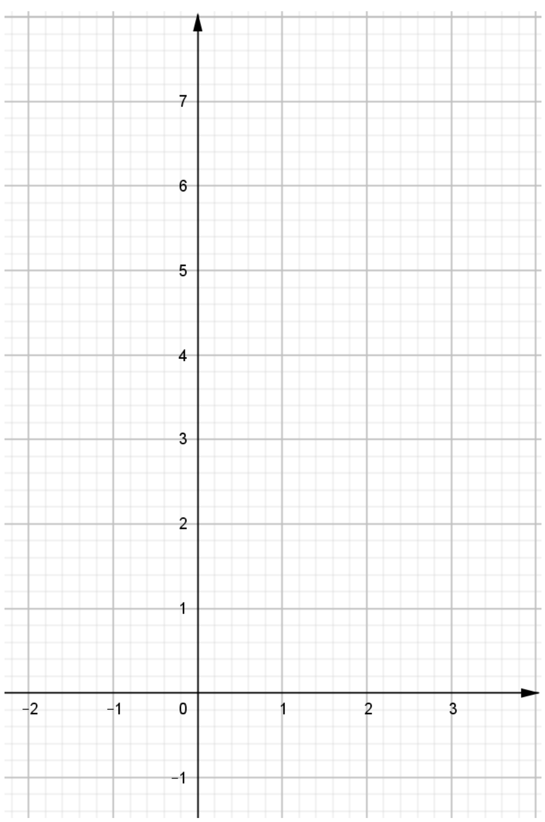
16) $x = 2y^2, \quad x + y = 1$



17) $x = 1 - y^2, \quad x = y^2 - 1$

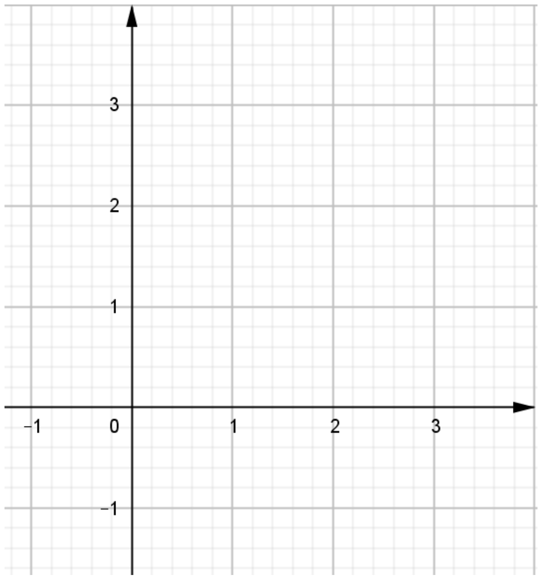


18) Use calculus to find the area of the triangle with the given vertices: $(0,0)$, $(2,1)$, $(-1,6)$



19) Use the Midpoint Rule with $n=4$ to approximate the area of the region bounded by the given curves:

$$y=\sqrt[3]{16-x^3}, \quad y=x, \quad x=0$$



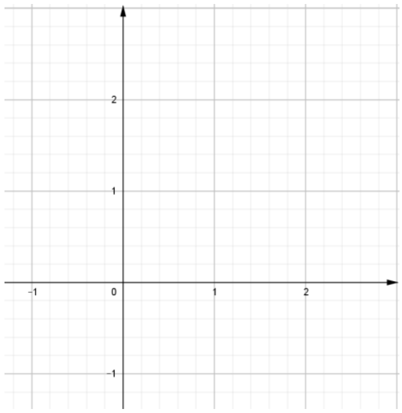
Use a graphing calculator to find approximate x-coordinates of the points of intersection of the given curves. Then find (approximately) the area of the region bounded by the curves.

20) $y=x^2, \quad y=2\cos x$

21) $y=x\cos(x^2), \quad y=x^3$

22) The curve with equation $y^2=x^2(x+3)$ is called **Tschirnhausen's cubic**. If you graph this curve you will see that part of the curve forms a loop. Find the area enclosed by the loop.

23) Find the area of the region bounded by the parabola $y = x^2$, the tangent line to this parabola at $(1,1)$, and the x-axis.



24) Find the number b such that the line $y = b$ divides the region bounded by the curves $y = x^2$ and $y = 4$ into two regions with equal area.

25) Find the values of c such that the area of the region enclosed by the parabolas $y = x^2 - c^2$ and $y = c^2 - x^2$ is 576.