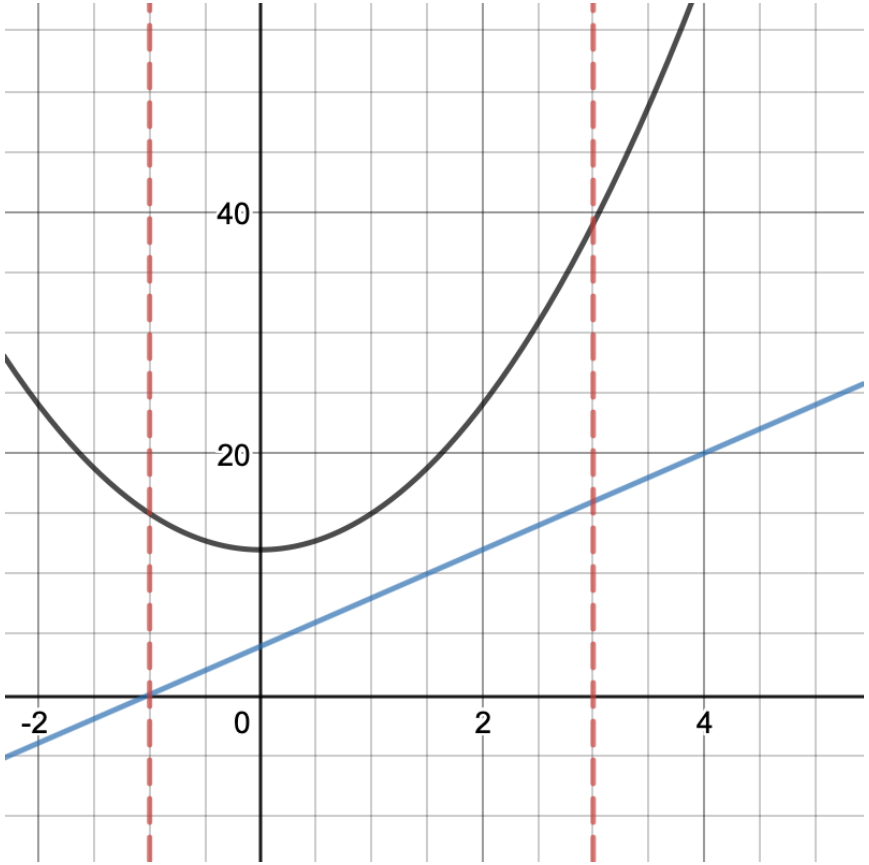
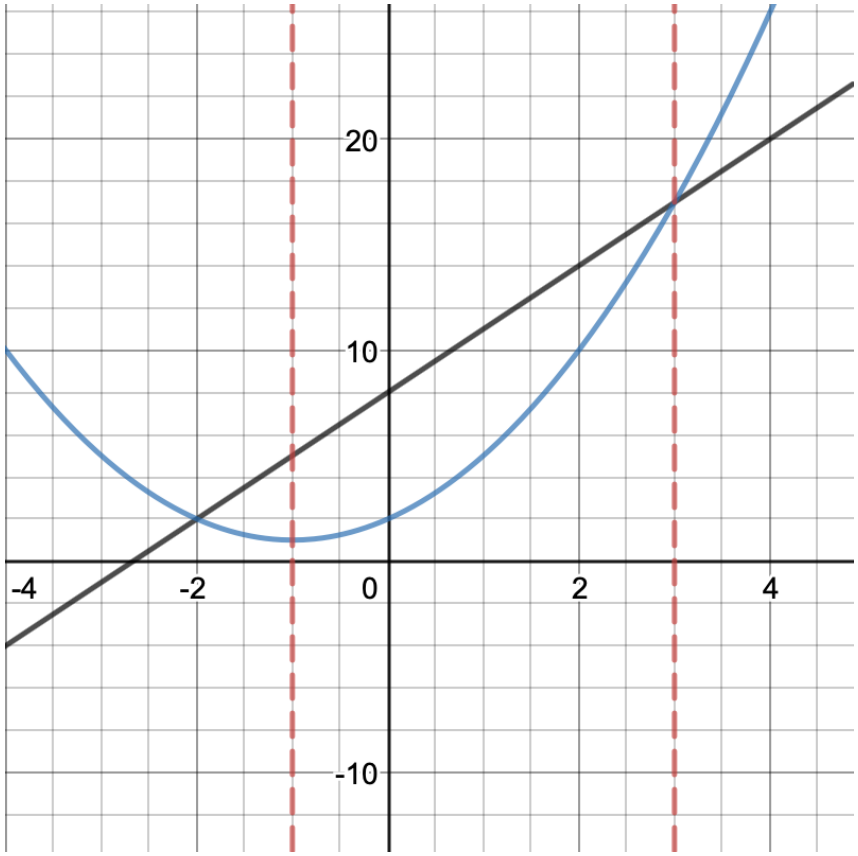
Area Between Curves

Find the area of the region bounded by the curves over the interval.

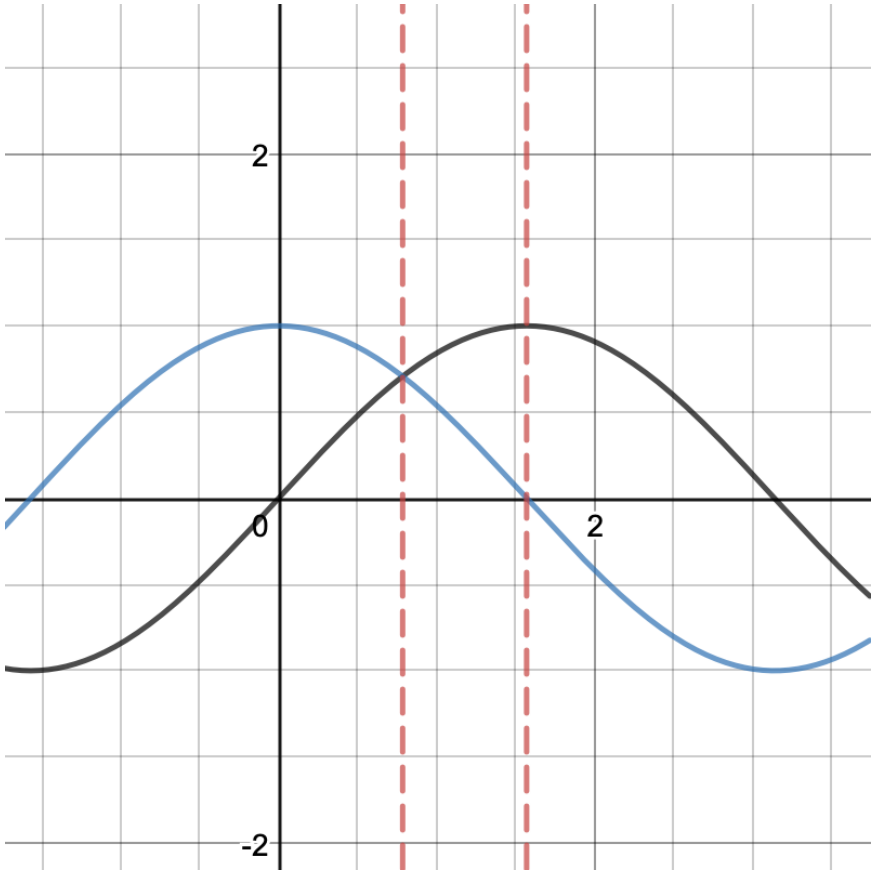
1. $y = 3x^2 + 12$ and $y = 4x + 4$ over $[-3,3]$



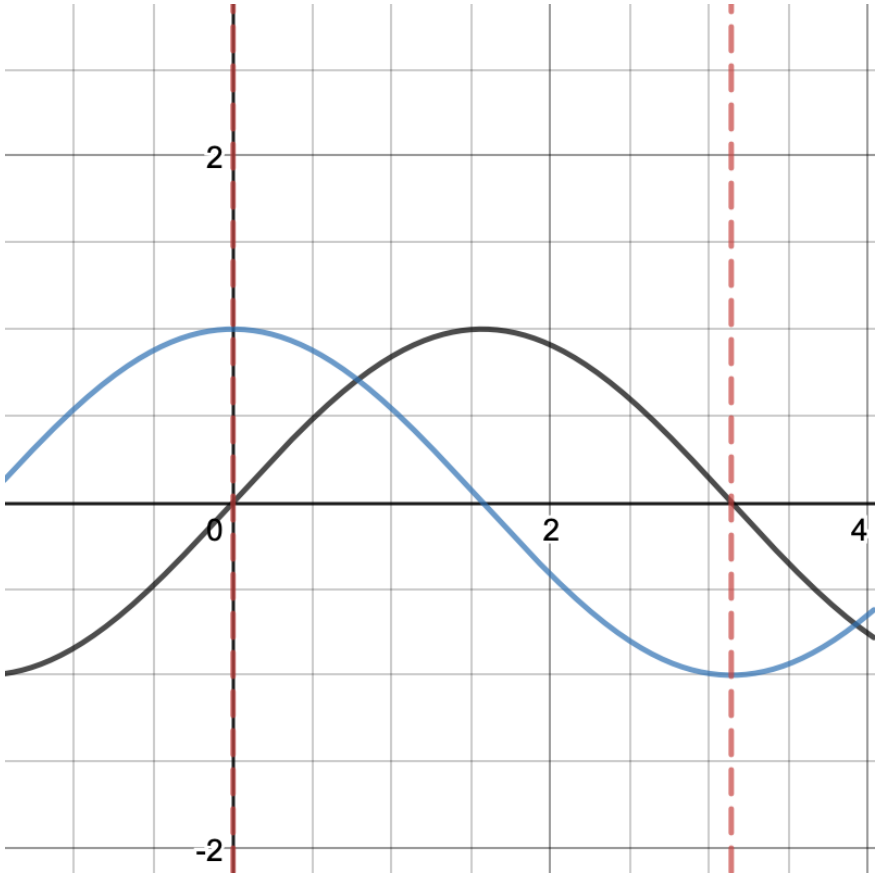
2. $y = 3x + 8$ and $y = x^2 + 2x + 2$ over $[-1,3]$



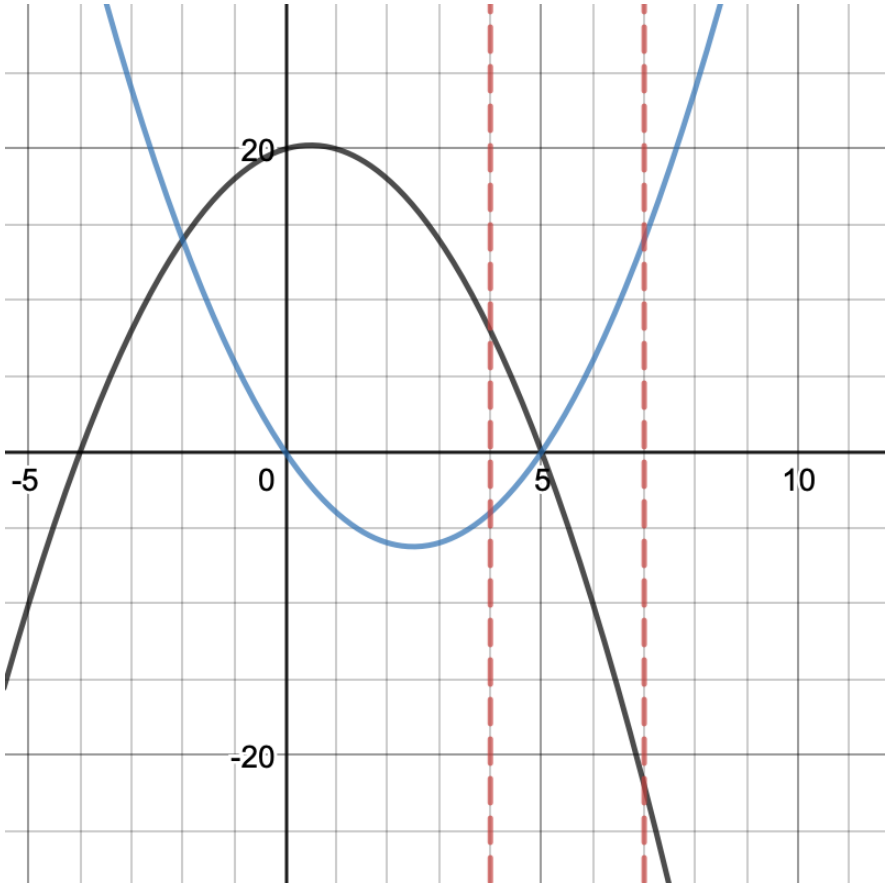
3. $y = \sin(x)$ and $y = \cos(x)$ over $\frac{\pi}{4} \leq x \leq \frac{\pi}{2}$



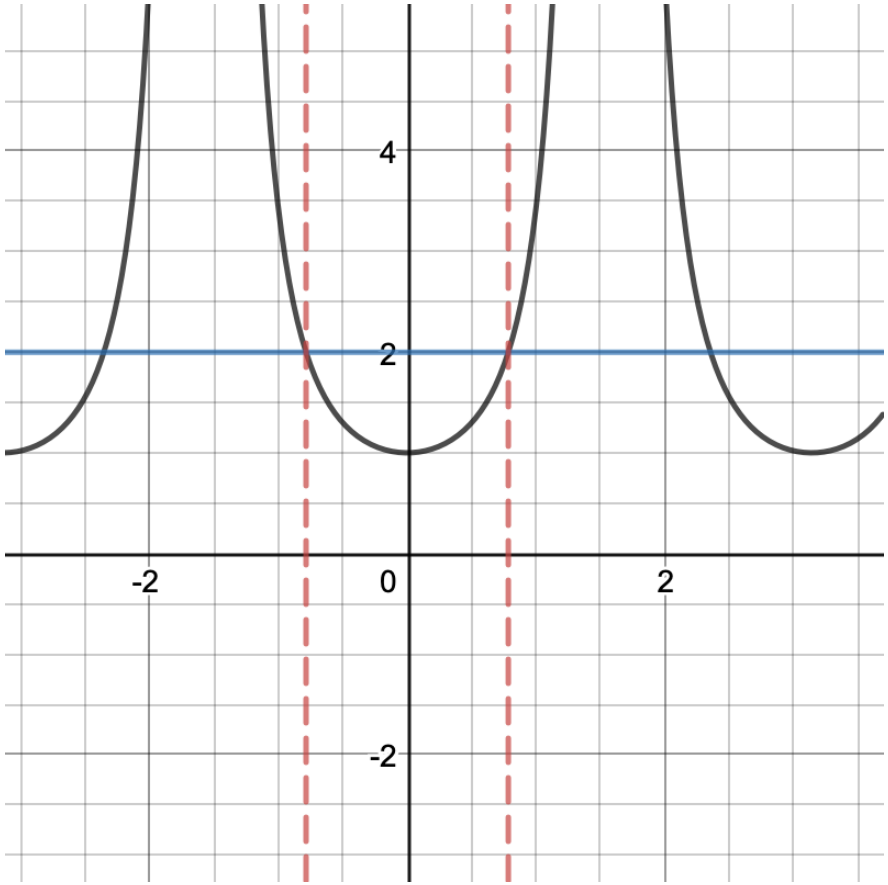
4. $y = \sin(x)$ and $y = \cos(x)$ over $0 \leq x \leq \pi$



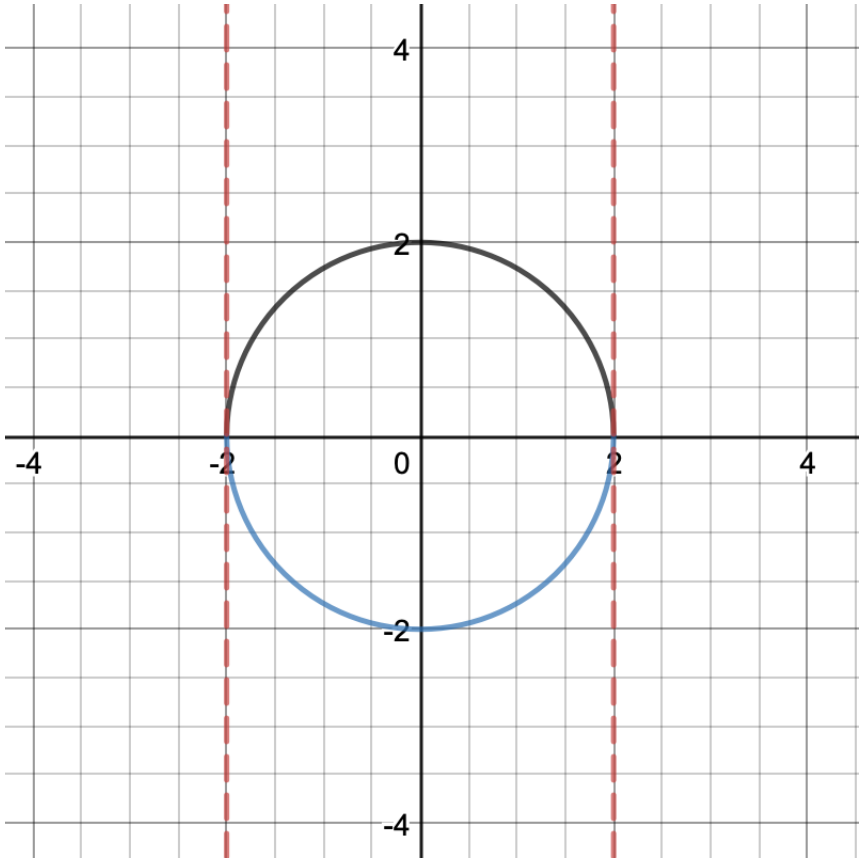
5. $f(x) = 20 + x - x^2$ and $g(x) = x^2 - 5x$ over $4 \leq x \leq 7$



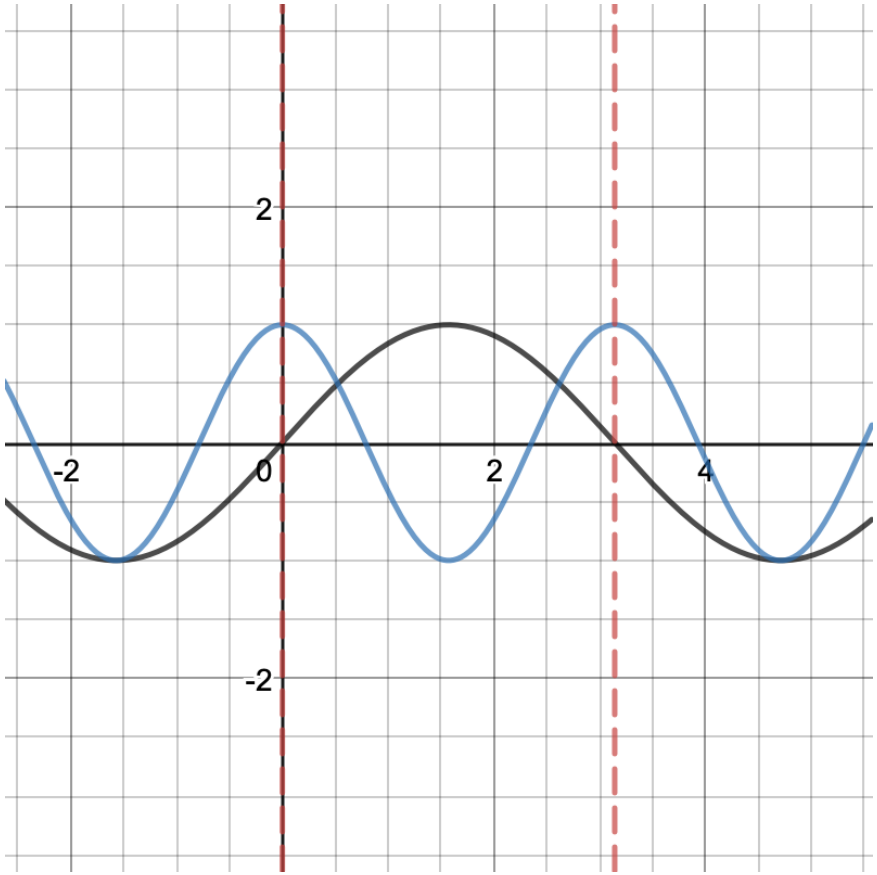
6. $y = sec^2(x)$ and $y = 2$ over $-\frac{\pi}{4} \leq x \leq \frac{\pi}{4}$



7. $y = \sqrt{4 - x^2}$ and $y = -\sqrt{4 - x^2}$ over $-2 \leq x \leq 2$ using geometry

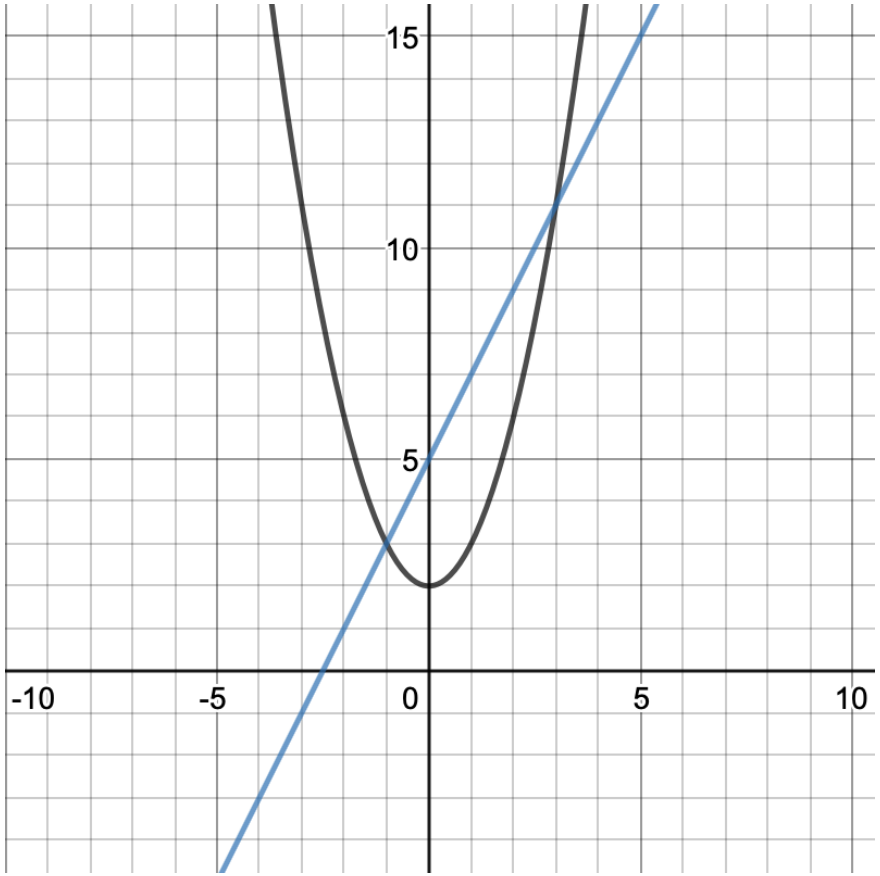


8. $y = \sin(x)$ and $y = \cos(2x)$ over $0 \leq x \leq 2\pi$

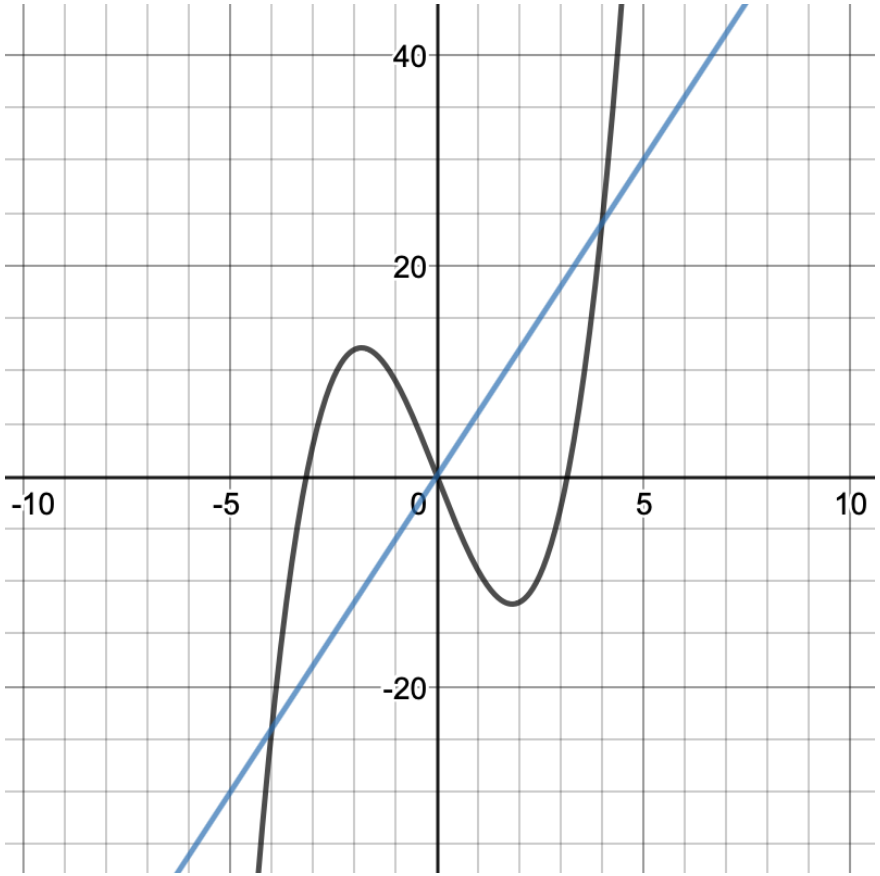


Find the area of the bonded region.

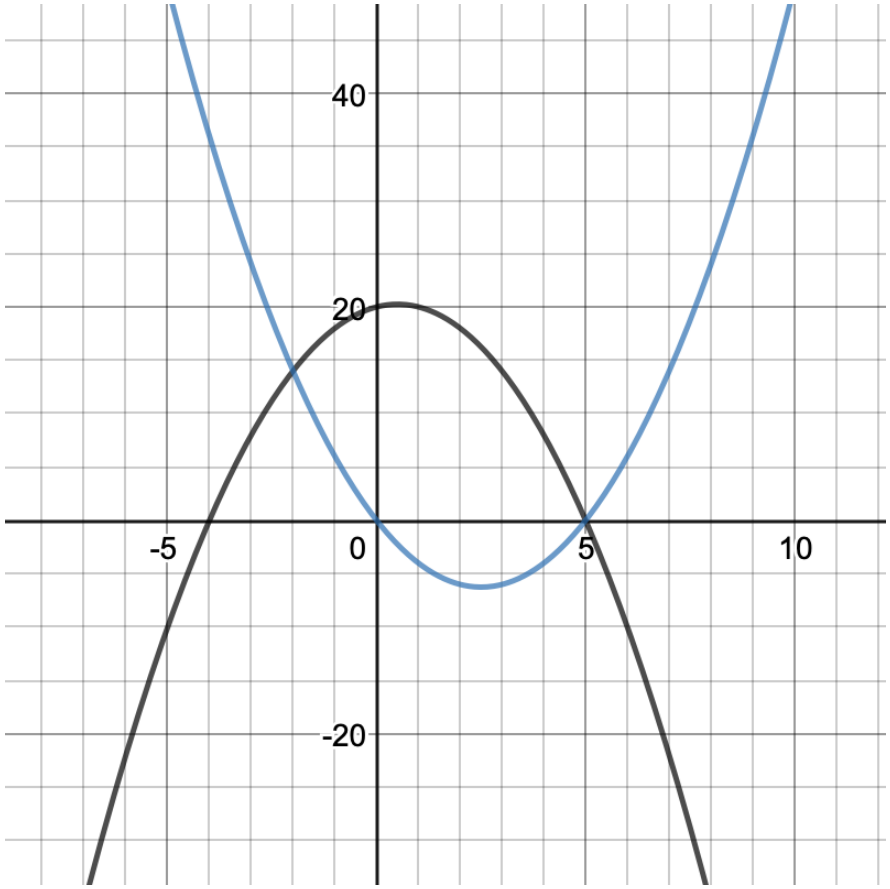
9. $f(x) = x^2 + 2$ and $g(x) = 2x + 5$



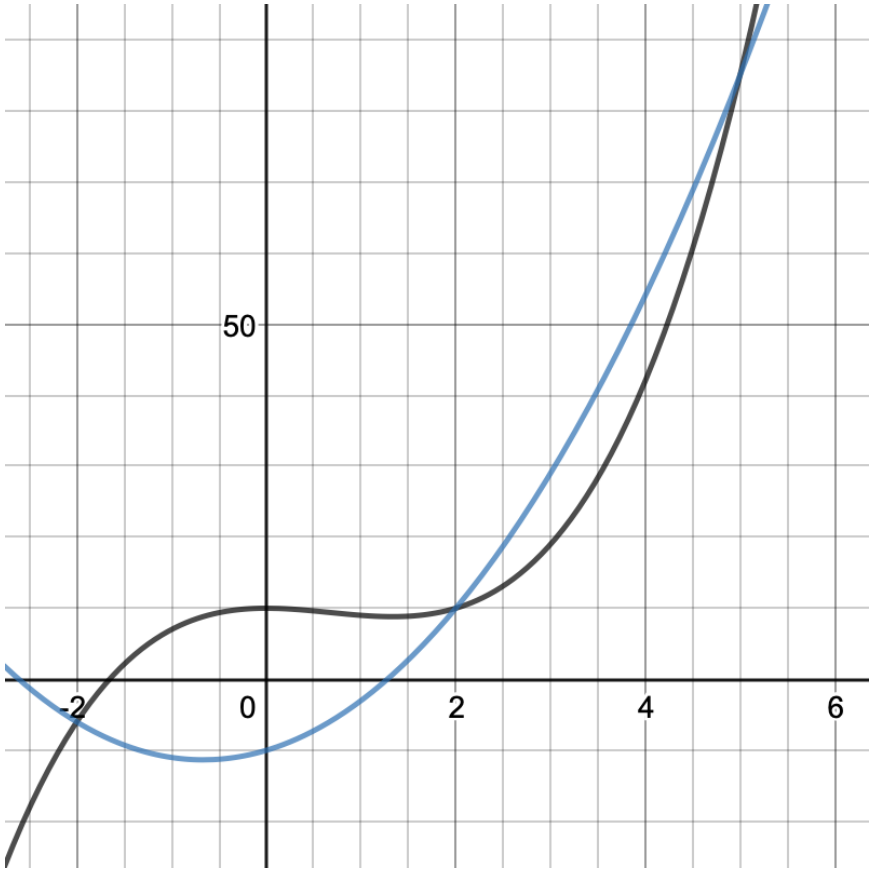
10. $f(x) = x^3 - 10x$ and $g(x) = 6x$



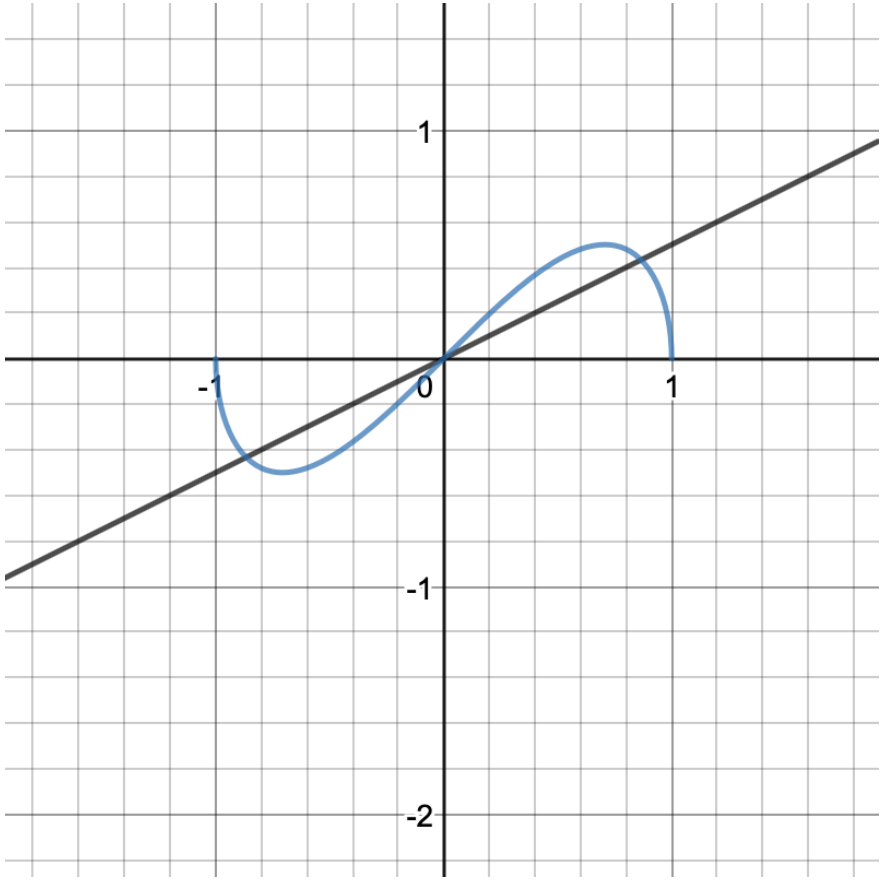
11. $f(x) = 20 + x - x^2$ and $g(x) = x^2 - 5x$



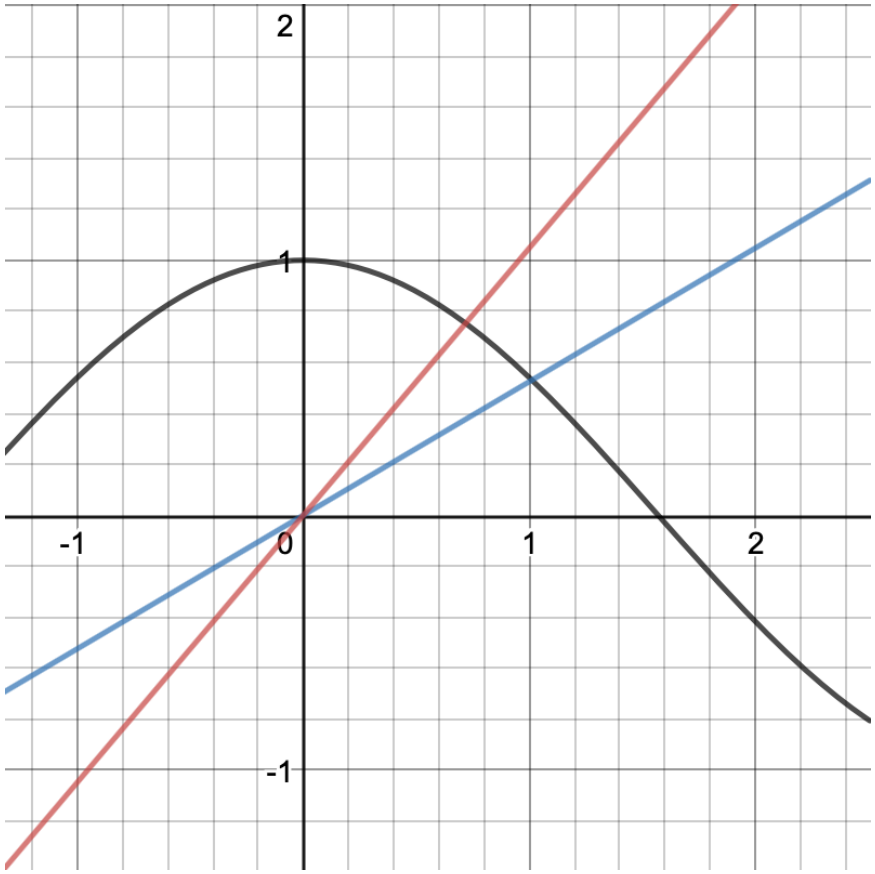
12. $y = x^3 - 2x^2 + 10$ and $y = 3x^2 + 4x - 10$



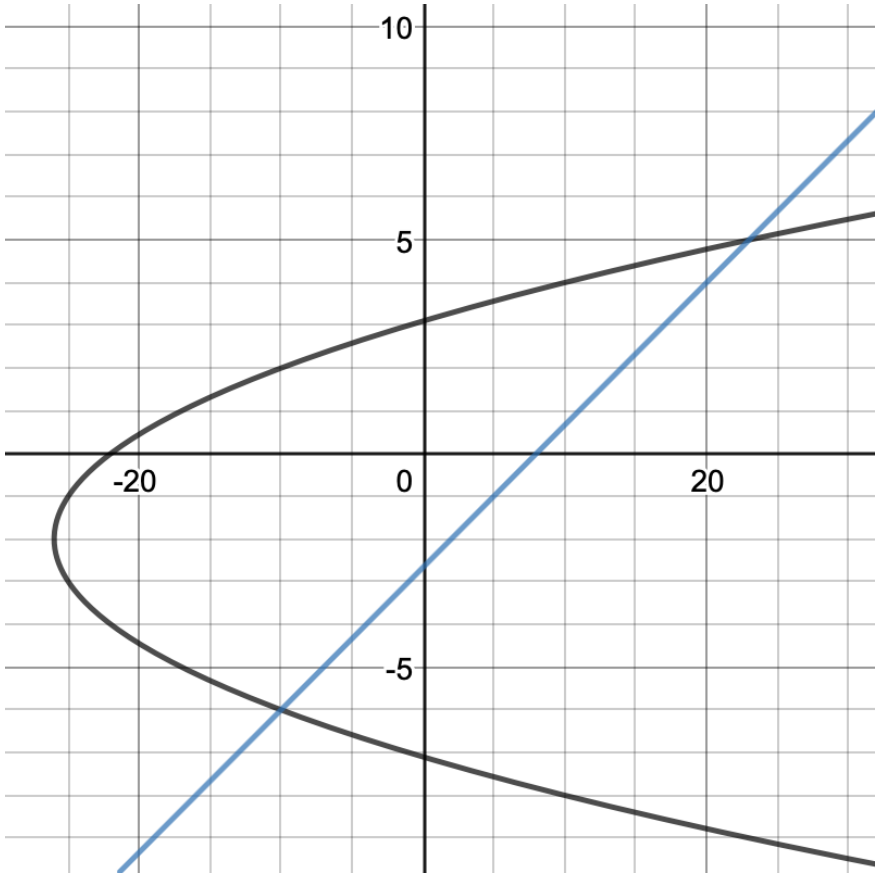
13. $y = \frac{1}{2}x$ and $y = x\sqrt{1 - x^2}$



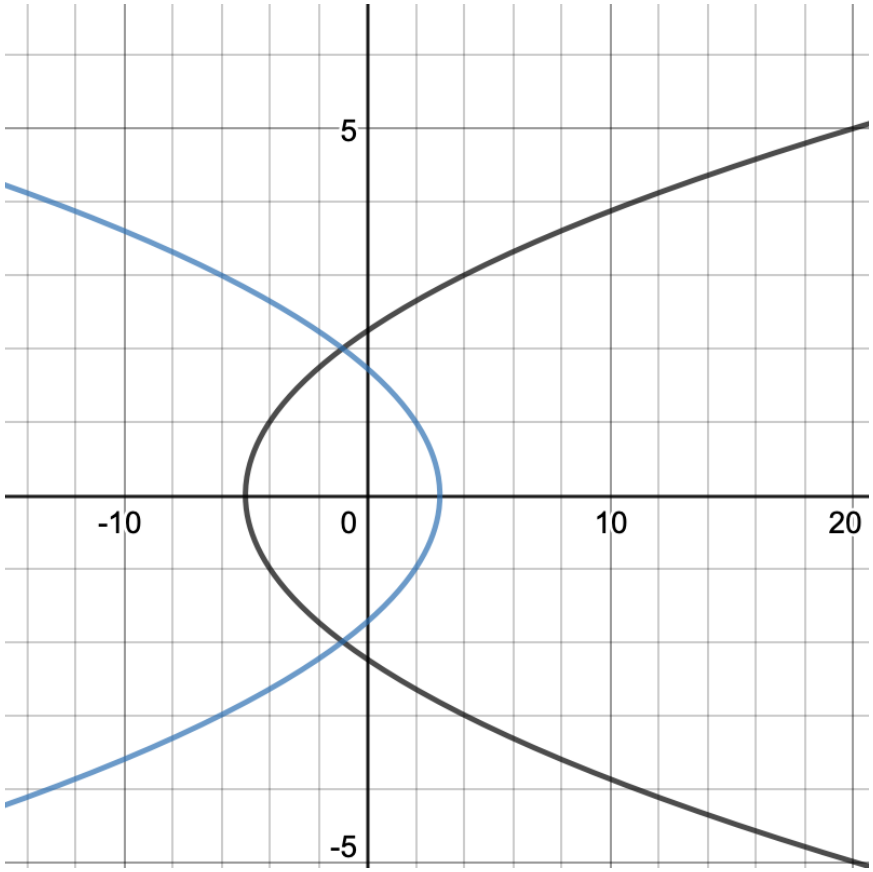
14. $y = cos(x)$ and $y = \frac{\pi}{6}x$ and $y = \frac{\pi}{3}x$



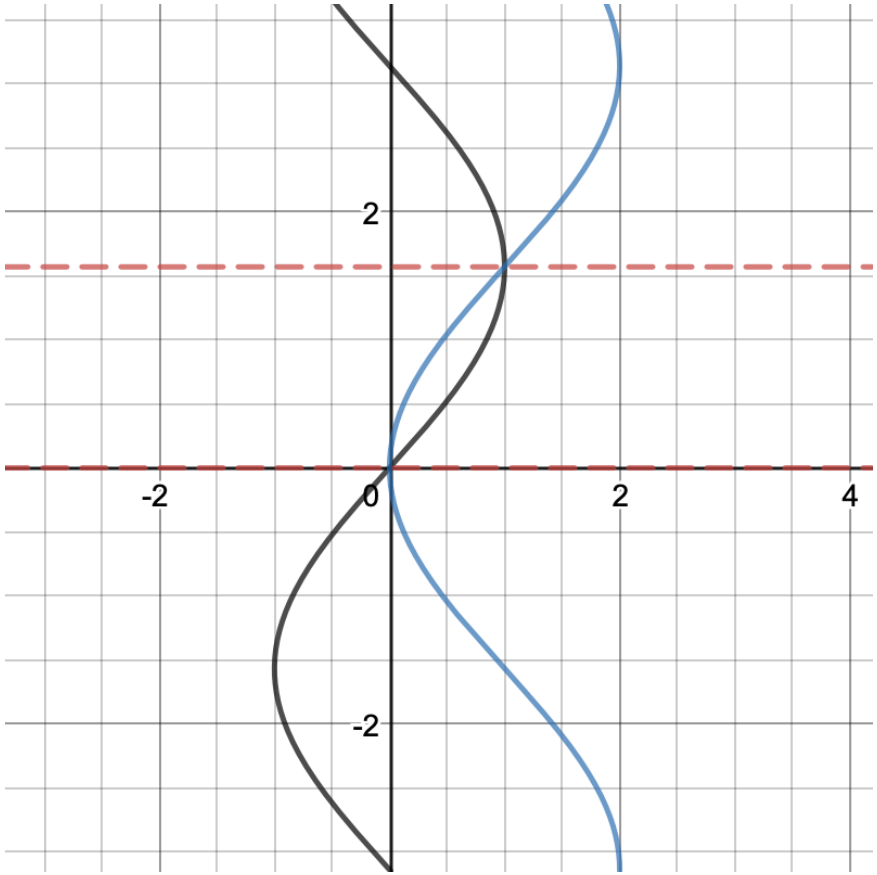
15. $x = y^2 + 4y - 22$ and $x = 3y + 8$



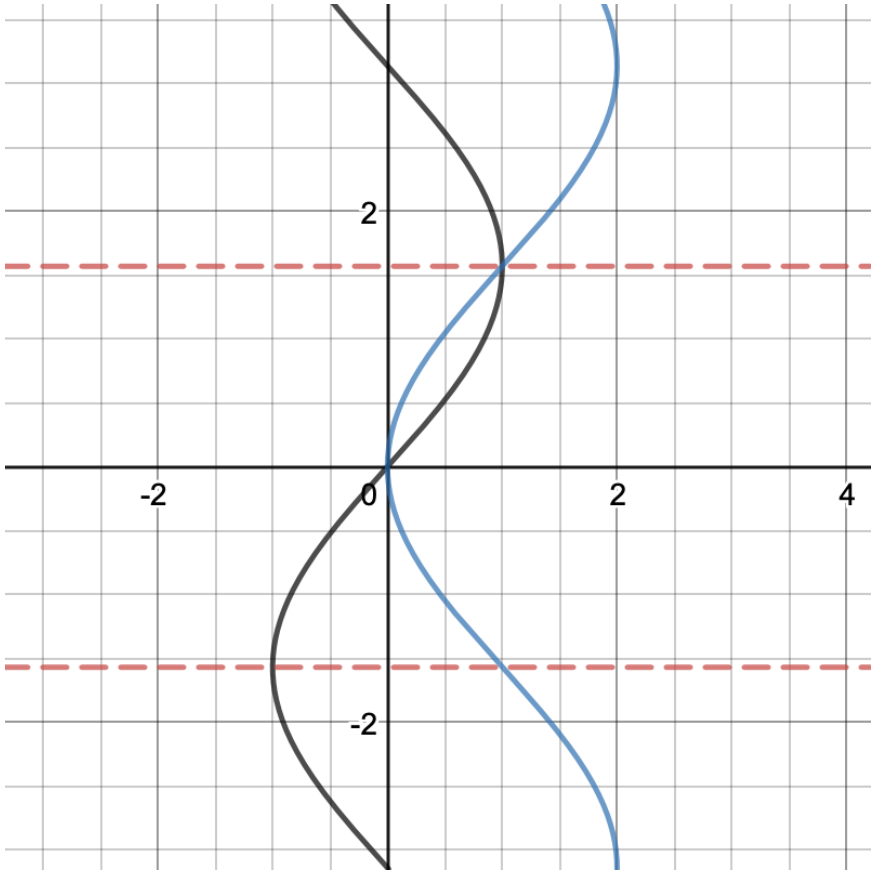
16. $x = y^2 - 5$ and $x = 3 - y^2$



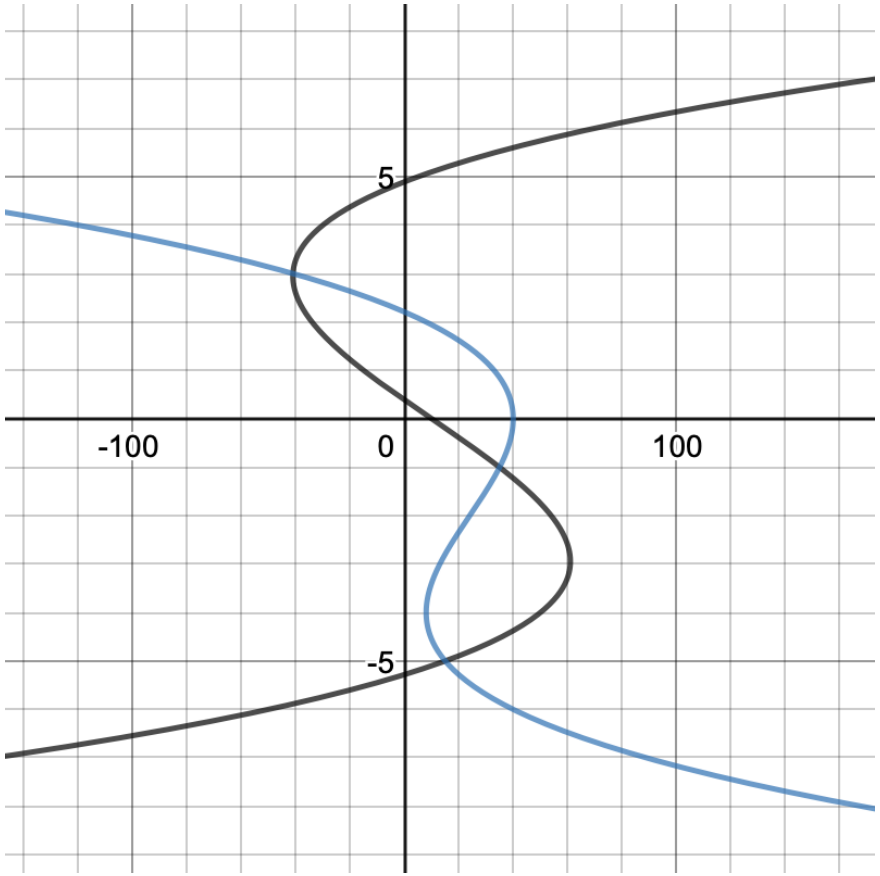
17. $x = sin(y)$ and $x = 1 - cos(y)$ and $y = 0$ and $y = \frac{\pi}{2}$



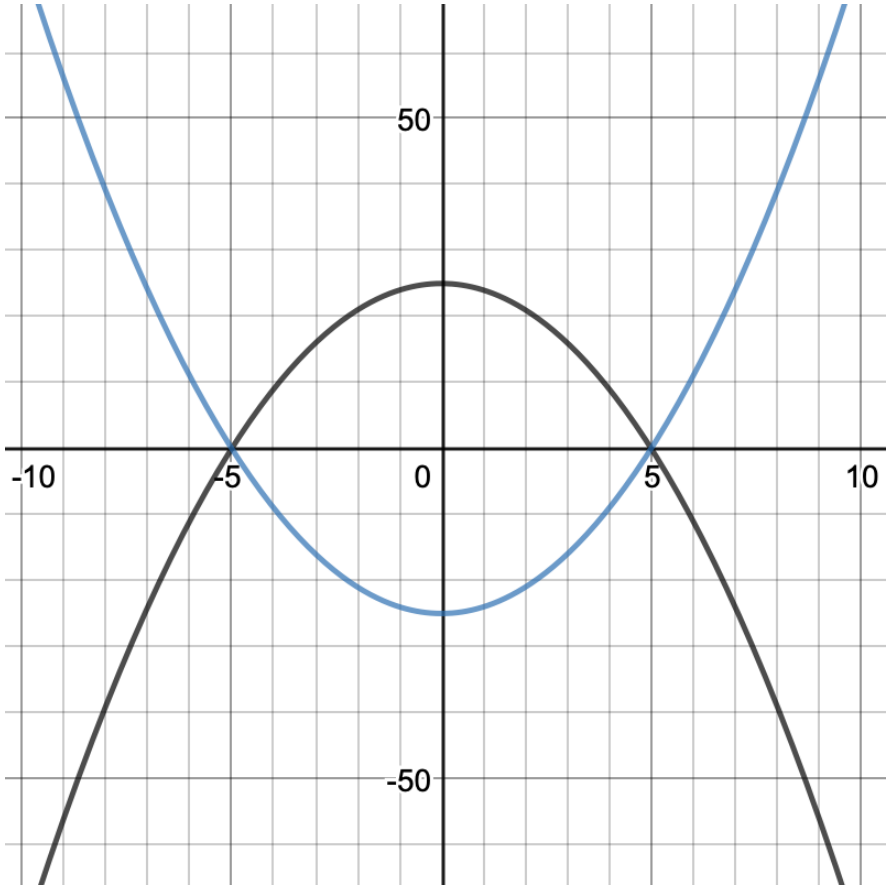
18. $x = sin(y)$ and $x = 1 - cos(y)$ and $y = -\frac{\pi}{2}$ and $y = \frac{\pi}{2}$



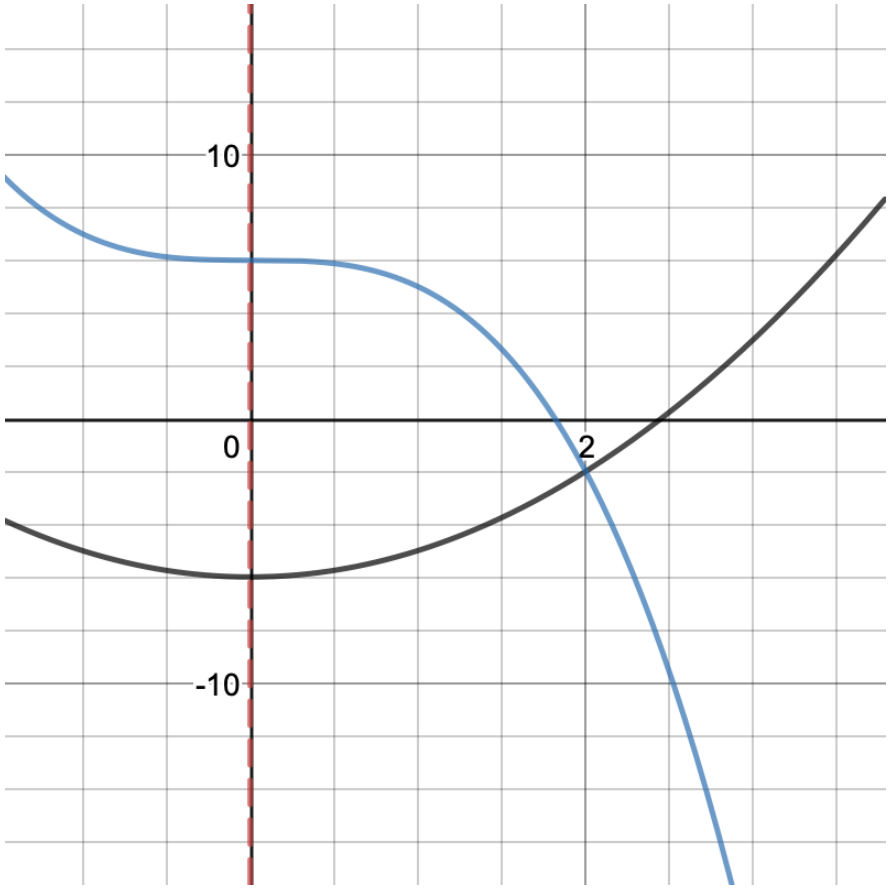
19. $x = y^3 - 26y + 10$ and $x = 40 - 6y^2 - y^3$



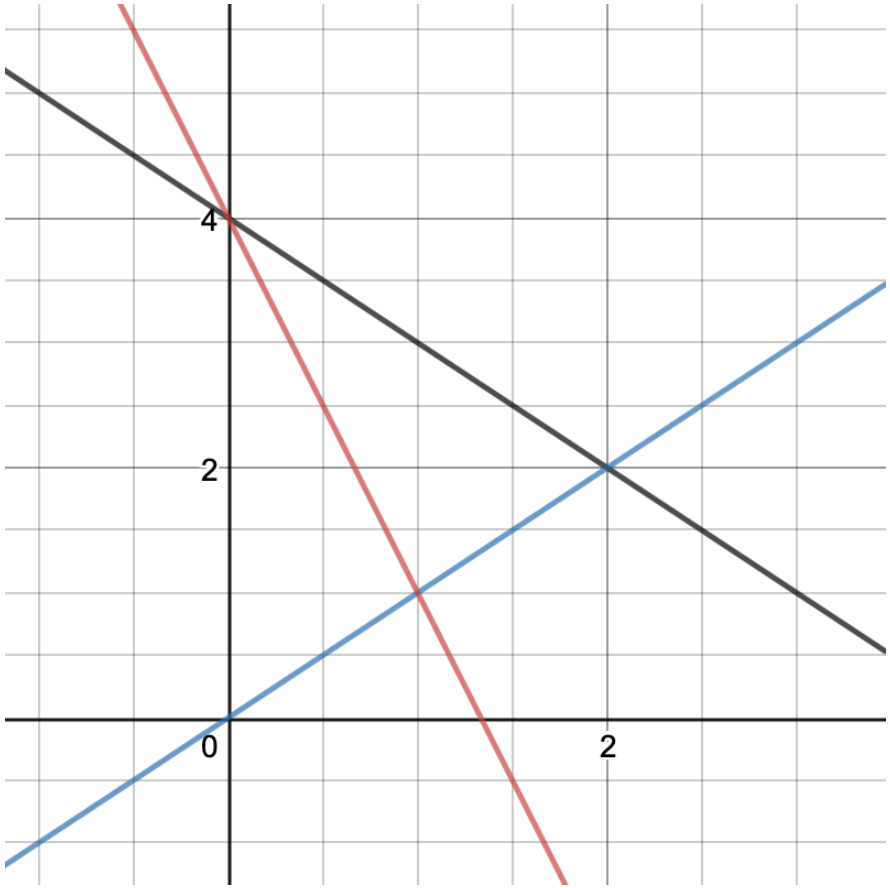
20. $y = 25 - x^2$ and $y = x^2 - 25$



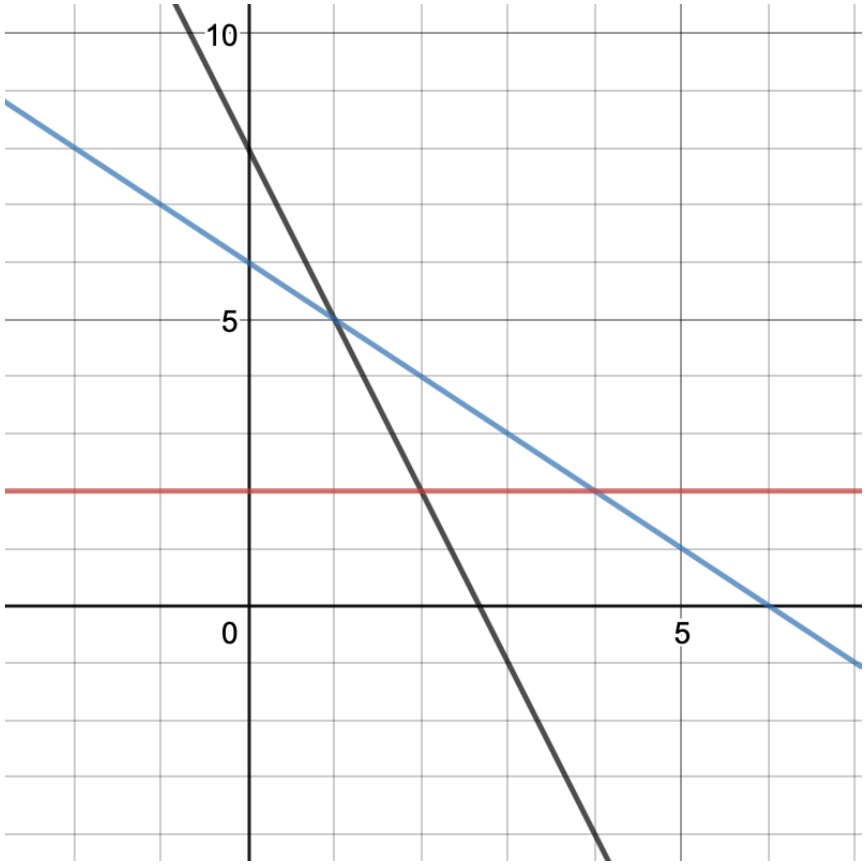
21. $y = x^2 - 6$ and $y = 6 - x^3$ and $x = 0$



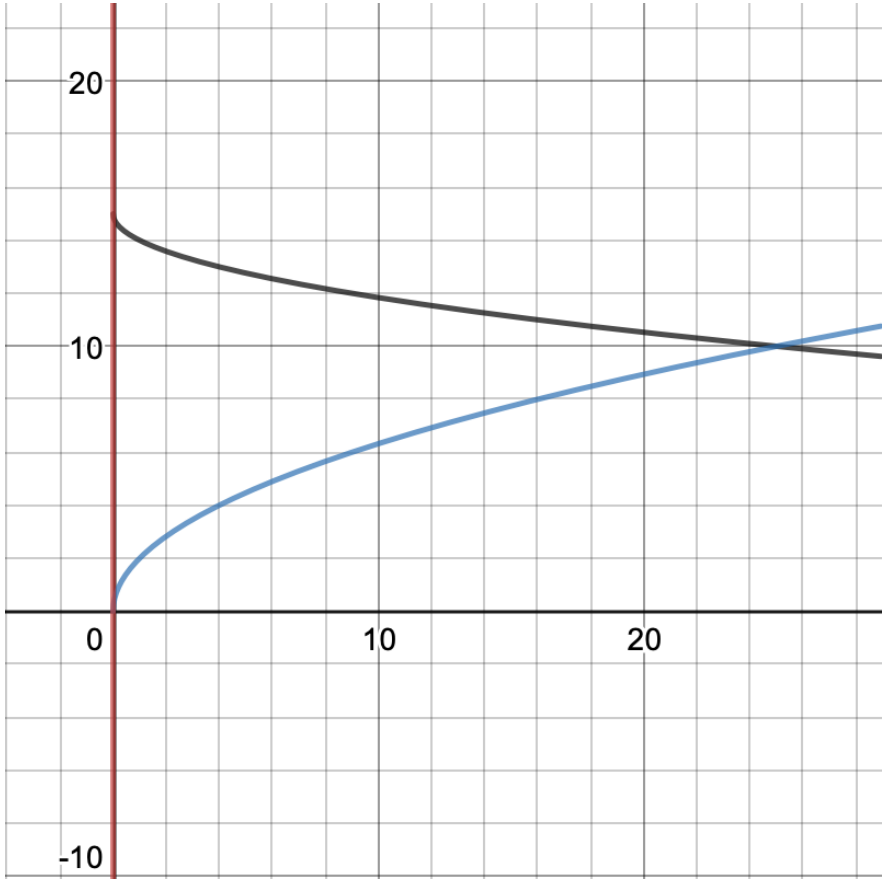
22. $x + y = 4$ and $x - y = 0$ and $3x + y = 4$



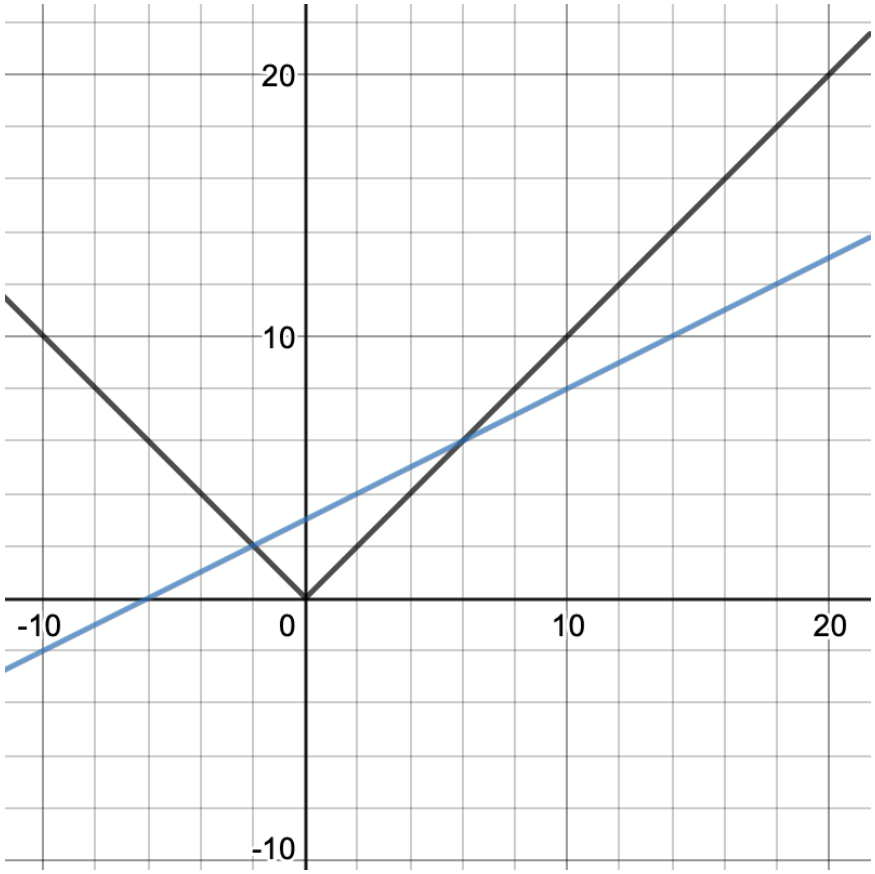
23. $y = 8 - 3x$ and $y = 6 - x$ and $y = 2$



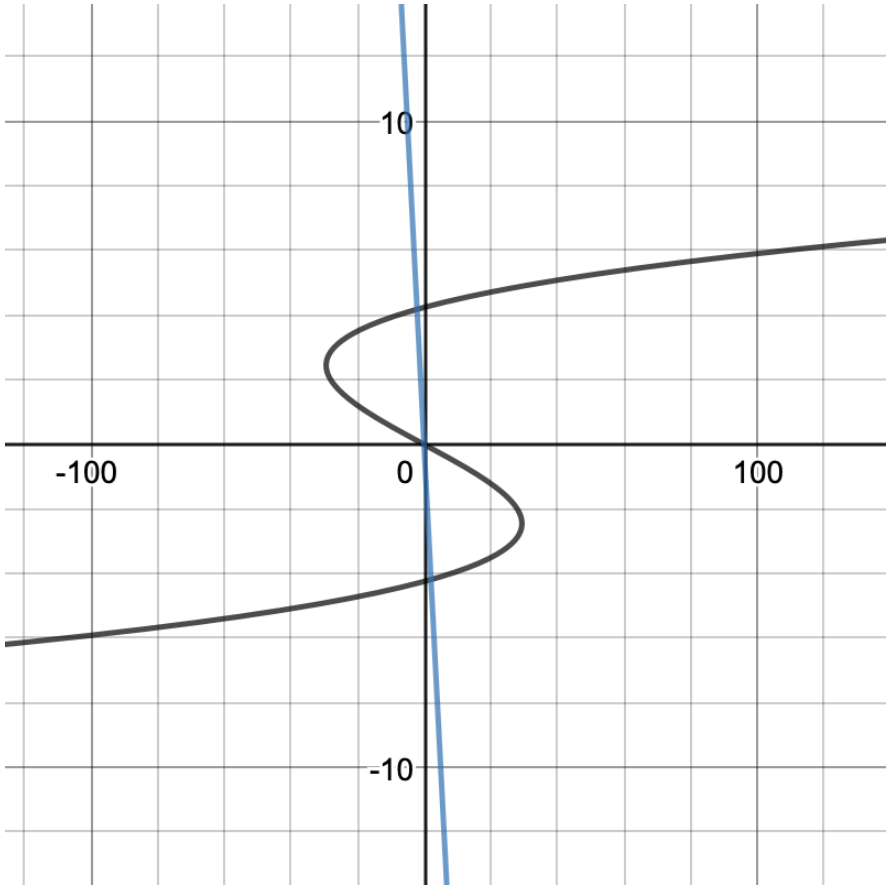
24. $y = 15 - \sqrt{x}$ and $y = 2\sqrt{x}$ and $x = 0$



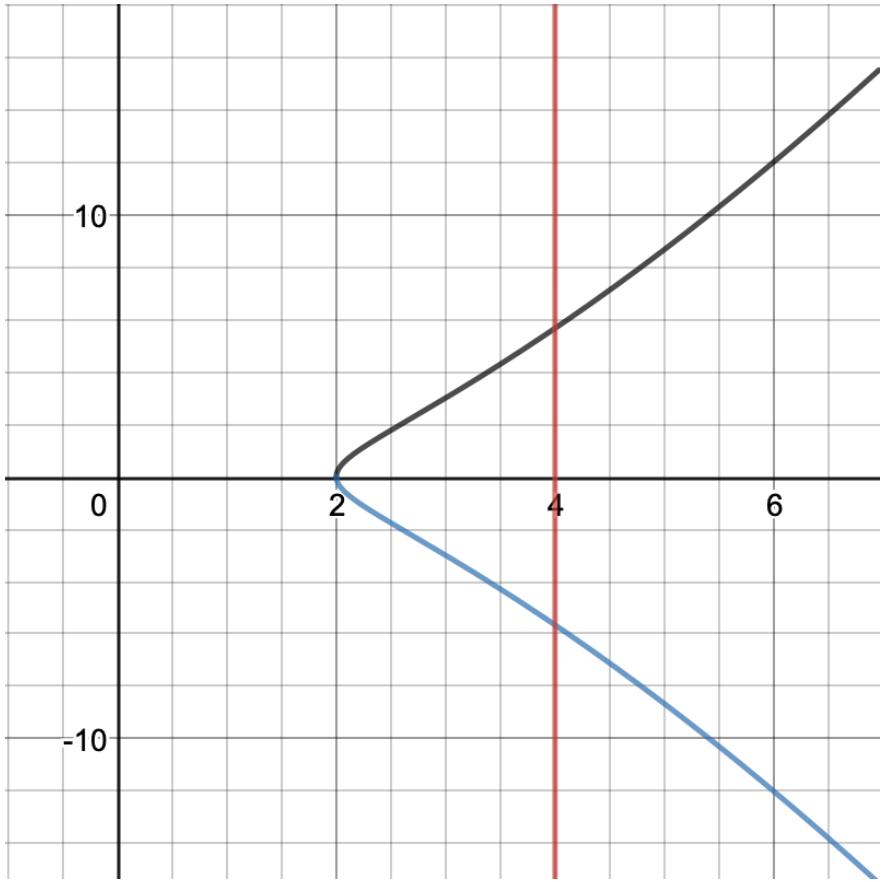
25. $y = |x|$ and $y = \frac{x}{2} + 3$



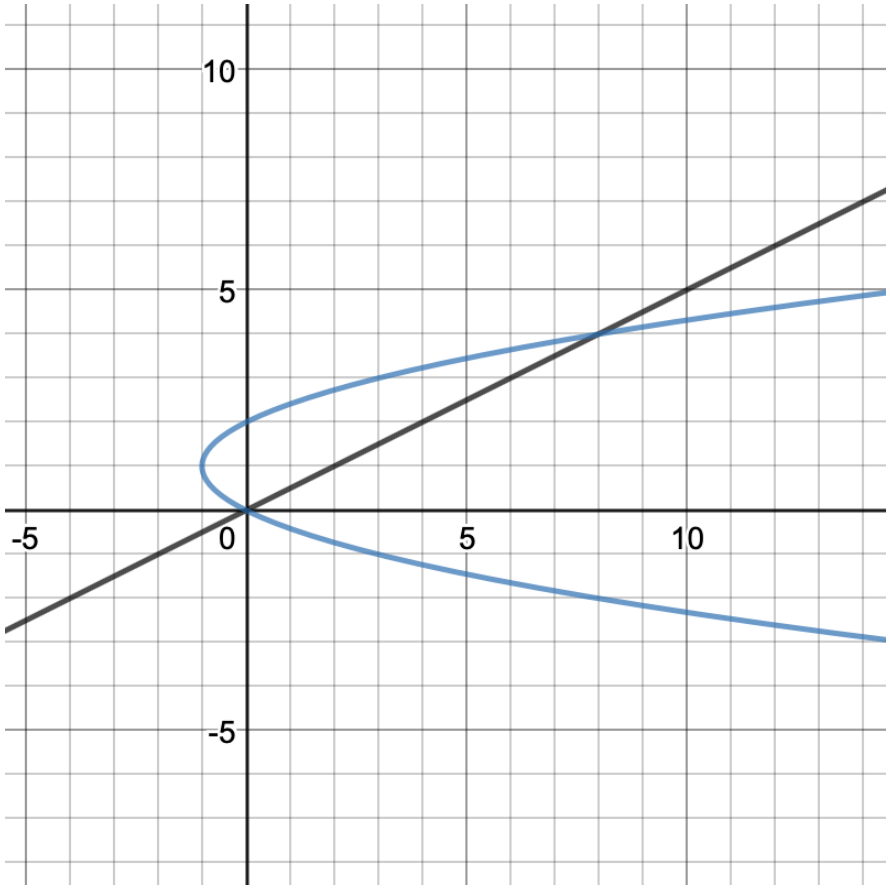
26. $x = y^3 - 18y$ and $y + 2x = 0$



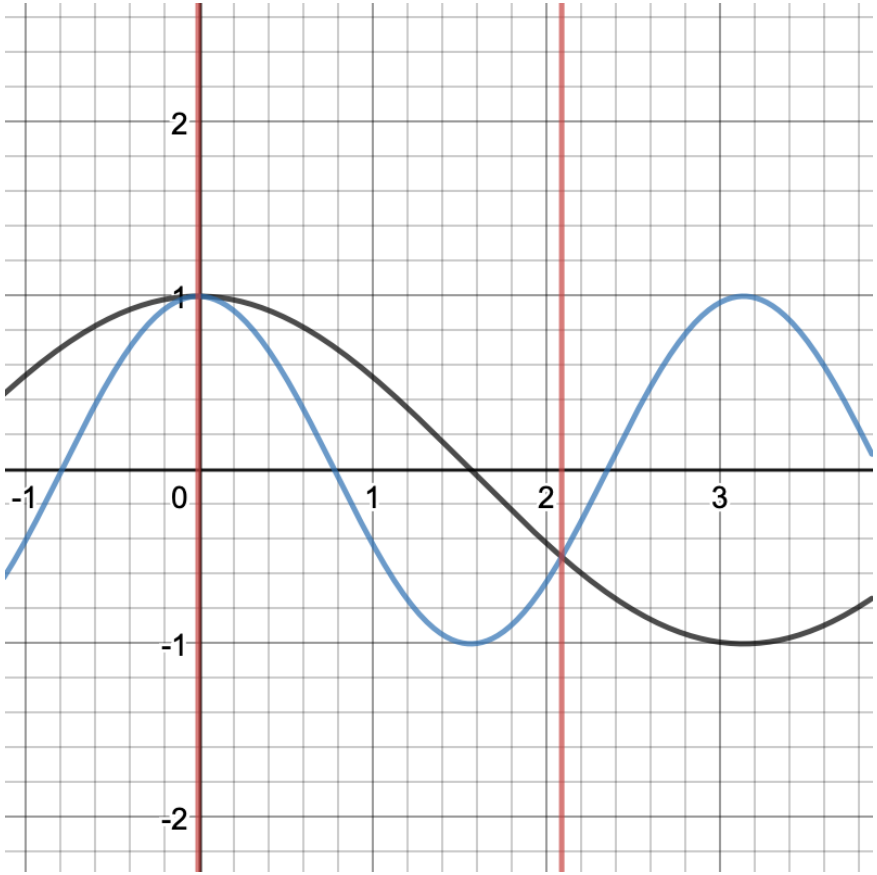
27. $y = x\sqrt{x-2}$ and $y = -x\sqrt{x-2}$ and $x = 4$



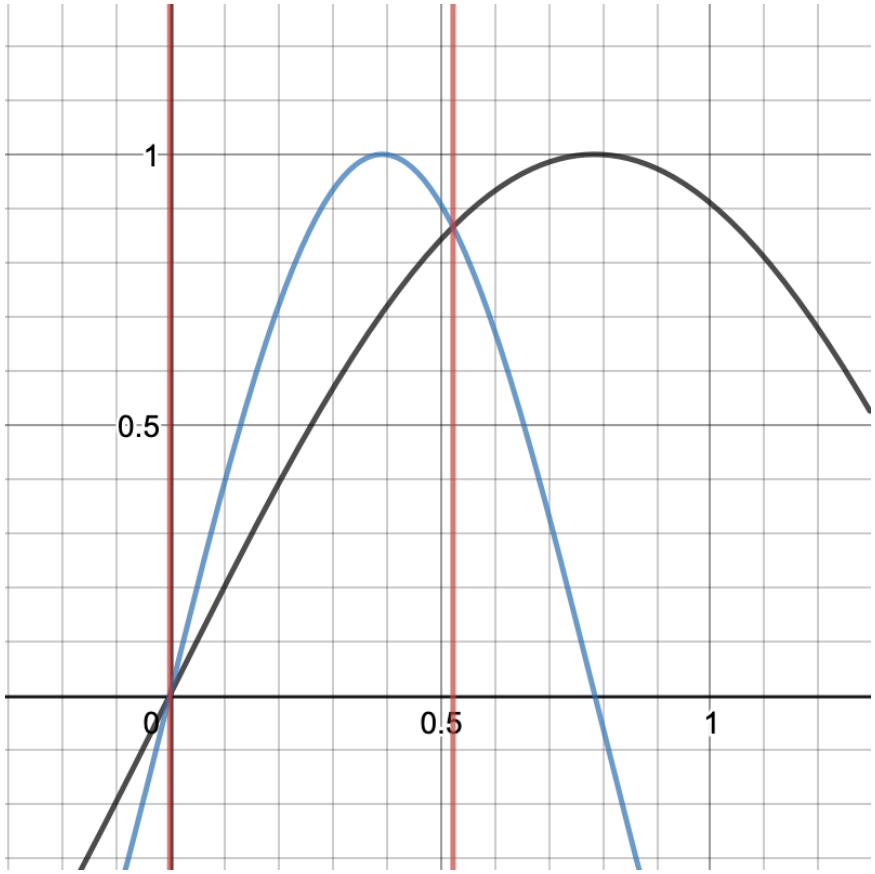
28. $x = 2y$ and $x + 1 = (y - 1)^2$



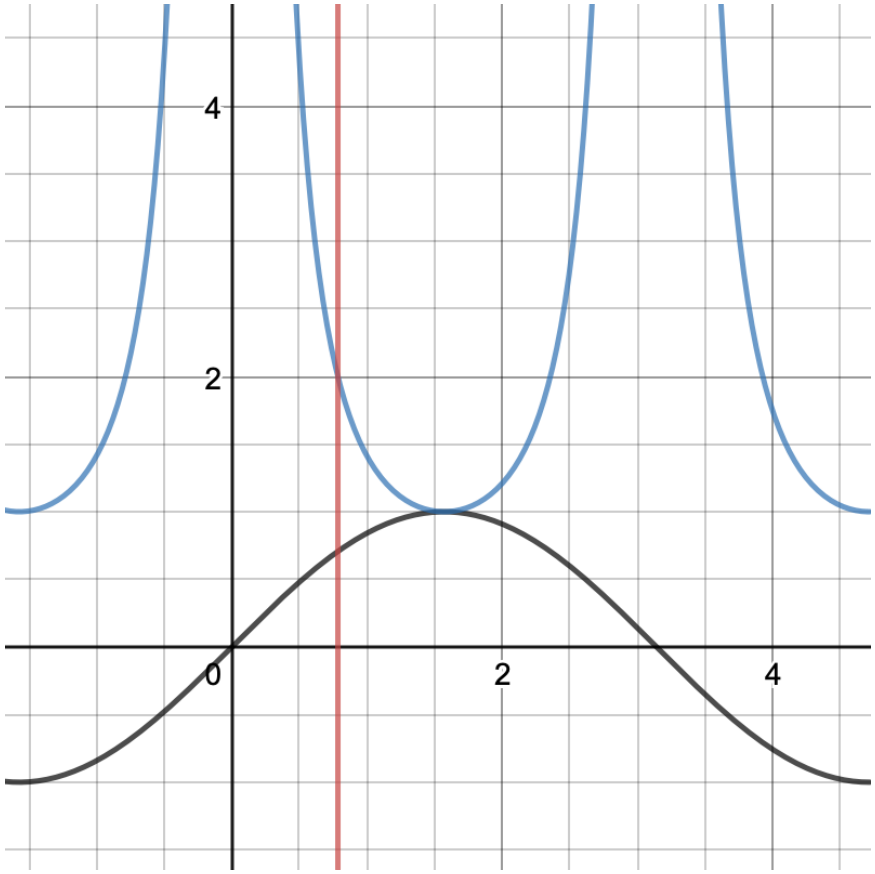
29. $y = \cos(x)$ and $y = cos(2x)$ and $x = 0$ and $x = \frac{2\pi}{3}$



30. $y = sin(2x)$ and $y = sin(4x)$ and $x = 0$ and $x = \frac{\pi}{6}$



31. $y = \sin(x)$ and $y = csc^2(x)$ and $x = \frac{\pi}{4}$



32. $x + y = 1$ and $\sqrt{x} + \sqrt{y} = 1$