

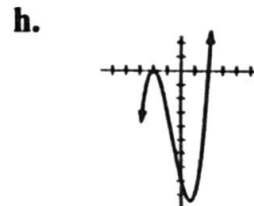
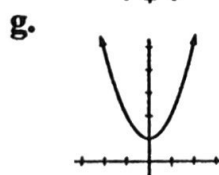
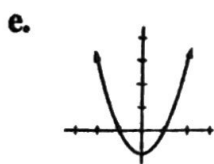
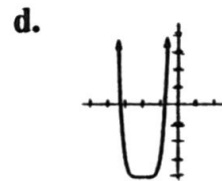
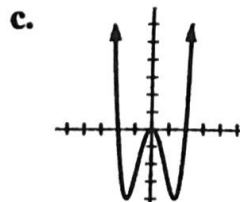
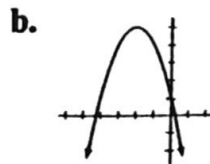
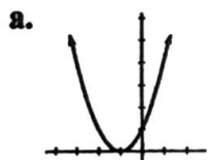
EXERCISES

Use the graph of $f(x) = x^2$ to write each function that is graphed after the indicated transformations.

1. Shift up 5 units
2. Shift down 5 units
3. Shift right 5 units
4. Shift left 5 units
5. Reflect about x -axis
6. Reflect about y -axis
7. Stretch vertically by a factor of 5
9. Shift left 5 units
10. Shift up 3 units
8. Stretch horizontally by a factor of 5
- Reflect about x -axis
- Reflect about y -axis
11. Three transformations: Shift up 2 units, Reflect about the y -axis, and Shift right 1 unit
12. The graph of a function is made after the following three transformations applied to the graph of $f(x) = x^3$. Write the function.
 1. Reflect about the x -axis
 2. Shift up 4 units
 3. Shift right 6 units
13. The graph of a function is made after the following three transformations applied to the graph of $y = \sqrt{x}$. Write the function.
 1. Shift left 6 units
 2. Reflect about the y -axis
 3. Shift down 4 units

Match each of the function with its graph.

- | | | | |
|--------------------|-----------------------|---------------------------|---------------------------|
| 14. $y = x^2 + 1$ | 15. $y = x^2 - 1$ | 16. $f(x) = (x+1)^2$ | 17. $f(x) = -(x+2)^2 + 5$ |
| 18. $y = -x^3 + 1$ | 19. $y = (x+2)^6 - 4$ | 20. $f(x) = (x+2)^2(x-2)$ | 21. $f(x) = x^2(x^2 - 4)$ |



Graph each of the following polynomial functions.

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|--------------------------------------|---------------------------------|------------------------------|
| 22. $y = x^3 - 2x$ | 23. $f(x) = -x^3 + 3x^2$ | 24. $f(x) = x^4 - 4x^2$ |
| 25. $y = (x+2)^2(x-2)$ | 26. $f(x) = (x^2 - 4)(x^2 - 2)$ | 27. $f(x) = -2x^3 - x^2 + x$ |
| 28. $y = -x^4 + 3x^3 - x^2 - 3x + 2$ | 29. $y = x^5 - 5x^3 + 4x$ | 30. $f(x) = x^3 + 6x^2 + 9x$ |
| 31. $f(x) = 9 - x^2 $ | 32. $f(x) = x^3 - 1 $ | 33. $f(x) = x^3 - 2x $ |