# Homework for Section 2 (Graphical Transformations of Functions)

Write the equation of each graph after the indicated transformations.

1. The graph of $f(x) = |x|$ is translated four units downward.
2. The graph of $f(x) = |x|$ is translated to the right three units.
3. The graph of $f(x) = \sqrt{x}$ is translated one unit upward.
4. The graph of $f(x) = x^2$ is translated to the left five units.
5. The graph of $f(x) = x^2$ is translated to the right seven units and five units downward.
6. The graph of $f(x) = \sqrt{x}$ is translated to the left four units and six units downward.
7. The graph of $f(x) = x^3$ is translated to the left two units and four units upward.
8. The graph of $f(x) = |x|$ is translated to the left eight unit, stretched about the y-axis by a factor of 3, reflected about the x-axis.
9. The graph of $f(x) = \sqrt{x}$ is translated to the right four units, stretched about the x-axis by a factor of 2, reflected about the x-axis, and shifted upward three units.
10. The graph of $f(x) = x^2$ is translated to the right two units, shrunk about the x-axis by a factor of 3, reflected about the y-axis, and shifted downward four units.

Use transformations to graph each function and state the domain and range.

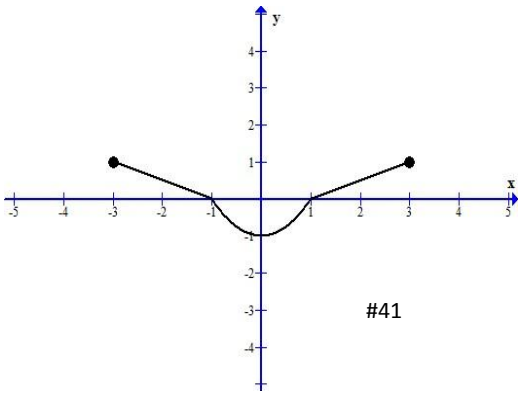
11. $f(x) = |x + 3|$
12. $f(x) = |x - 2|$
13. $f(x) = \sqrt{x - 1}$
14. $f(x) = x^2 + 2$
15. $f(x) = (x - 2)^2$
16. $f(x) = \sqrt{x} - 3$
17. $f(x) = x^3 + 1$
18. $f(x) = |-x|$
19. $(x) = -|x|$
20. $f(x) = \sqrt{-x}$
21. $f(x) = -x^2$
22. $f(x) = -x^2 + 3$
23. $f(x) = \sqrt{-x + 2} - 3$
24. $f(x) = (x + 2)^3 - 1$
25. $f(x) = |x - 3| + 2$
26. $(x) = -|x + 1| + 2$
27. $f(x) = -\sqrt{x + 3} - 2$
28. $f(x) = (2x - 3)^2 + 1$
29. $f(x) = 2(x + 1)^2 - 3$
30. $f(x) = -3\sqrt{x - 1} + 4$

31. $f(x) = -\frac{1}{2}(x+2)^3 - 1$
32. $f(x) = 3|x+1|$
33. $(x) = \left|\frac{1}{2}x + 4\right| - 2$
34. $f(x) = -\sqrt{x+1} - 3$
35. $f(x) = (-x-2)^2 + 1$
36. $f(x) = -(x-3)^2 - 2$
37. $f(x) = \sqrt{-x-2} + 1$
38. $f(x) = -x^3 + 3$
39. $f(x) = |-x-2| + 3$
40. $f(x) = -|2x+2| + 3$

Graph each of the following functions by transforming the given graph of $y = f(x)$

41.

a. $y = -f(x)$
b. $y = 2f(x)$
c. $y = f(x+2)$
d. $y = f(x-3)$
e. $y = -3f(x)$
f. $y = f(x+1) - 2$
g. $y = f(x-2) + 3$
h. $y = 3f(x+3) - 2$
i. $y = f(2x-4) + 1$
j. $y = f(-x+1) - 3$



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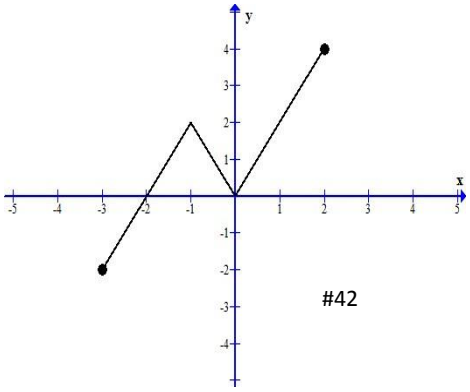
42.

a. $y = 3f(x)$
b. $y = -2f(x)$
c. $y = f(-x)$
d. $y = -f(x)$
e. $y = f(x+2)$
f. $y = f(x) - 3$
g. $y = f(x-1) + 2$
h. $y = 2f(x+1) - 1$
i. $y = f(-x+2) - 3$
j. $y = -f(x-2) - 4$



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