

DUE: A-day Tuesday 09/24/15, B-day Wednesday 09/25/15

Pre-Calculus: Lesson 1.4 Transformations p. 47 #5, 9, 11, 29-34 all, 51-63 odd, 66-68 all.

Please complete the assignment using the “tri-fold” method (You may use www.calcchat.com to check your work):

Procedures and Problem Solving

Sketching Transformations In Exercises 5–18, sketch the graphs of the three functions by hand on the same rectangular coordinate system. Verify your results with a graphing utility.

5. $f(x) = x$
 $g(x) = x - 4$
 $h(x) = 3x$

7. $f(x) = x^2$
 $g(x) = x^2 + 2$
 $h(x) = (x - 2)^2$

9. $f(x) = -x^2$
 $g(x) = -x^2 + 1$
 $h(x) = -(x - 2)^2$

11. $f(x) = x^2$
 $g(x) = \frac{1}{2}x^2$
 $h(x) = (2x)^2$

6. $f(x) = \frac{1}{2}x$
 $g(x) = \frac{1}{2}x + 2$
 $h(x) = \frac{1}{2}(x - 2)$

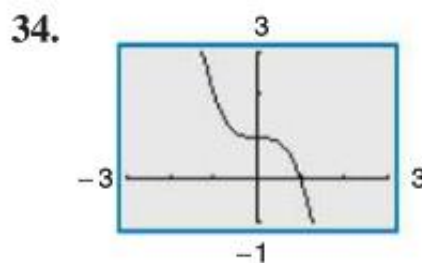
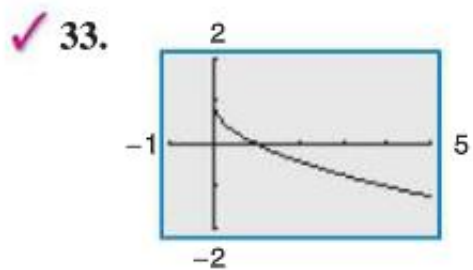
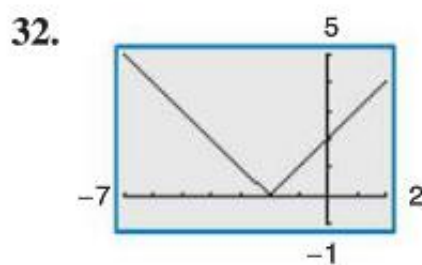
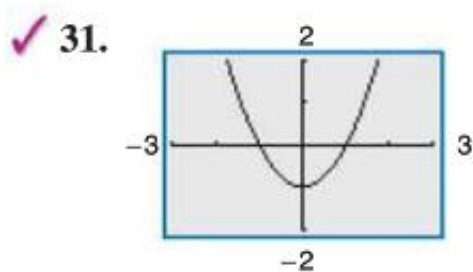
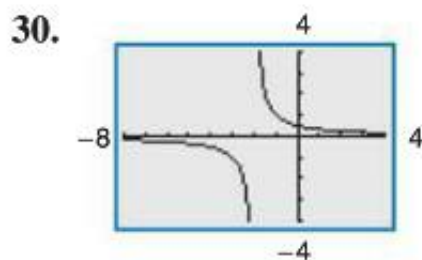
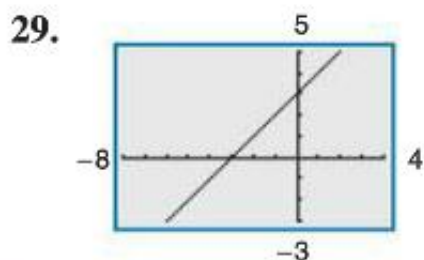
8. $f(x) = x^2$
 $g(x) = x^2 - 4$
 $h(x) = (x + 2)^2 + 1$

10. $f(x) = (x - 2)^2$
 $g(x) = (x + 2)^2 + 2$
 $h(x) = -(x - 2)^2 - 1$

12. $f(x) = x^2$
 $g(x) = \frac{1}{4}x^2 + 2$
 $h(x) = -\frac{1}{4}x^2$



Library of Parent Functions In Exercises 29–34, identify the parent function and describe the transformation shown in the graph. Write an equation for the graphed function.



Describing Transformations In Exercises 51–64, g is related to one of the six parent functions on page 41. (a) Identify the parent function f . (b) Describe the sequence of transformations from f to g . (c) Sketch the graph of g by hand. (d) Use function notation to write g in terms of the parent function f .

51. $g(x) = 2 - (x + 5)^2$ 52. $g(x) = -(x + 10)^2 + 5$

53. $g(x) = 3 + 2(x - 4)^2$ 54. $g(x) = -\frac{1}{4}(x + 2)^2 - 2$

55. $g(x) = 3(x - 2)^3$ 56. $g(x) = -\frac{1}{2}(x + 1)^3$

57. $g(x) = (x - 1)^3 + 2$

58. $g(x) = -(x + 3)^3 - 10$

59. $g(x) = \frac{1}{x + 8} - 9$ 60. $g(x) = \frac{1}{x - 7} + 4$

61. $g(x) = -2|x - 1| - 4$ 62. $g(x) = \frac{1}{2}|x - 2| - 3$

63. $g(x) = -\frac{1}{2}\sqrt{x + 3} - 1$ 64. $g(x) = -\sqrt{x + 1} - 6$

66. **Why you should learn it** (p. 41) The sales S (in millions of dollars) of the WD-40 Company from 2000 through 2008 can be approximated by the function



$$S(t) = 99\sqrt{t + 2.37}$$

where $t = 0$ represents 2000. (Source: WD-40 Company)

- Describe the transformation of the parent function $f(t) = \sqrt{t}$.
- Use a graphing utility to graph the model over the interval $0 \leq t \leq 8$.
- According to the model, in what year will the sales of WD-40 be approximately 400 million dollars?
- Rewrite the function so that $t = 0$ represents 2005. Explain how you got your answer.

Conclusions

True or False? In Exercises 67 and 68, determine whether the statement is true or false. Justify your answer.

67. The graph of $y = f(-x)$ is a reflection of the graph of $y = f(x)$ in the x -axis.
68. The graphs of $f(x) = |x| + 6$ and $f(x) = |-x| + 6$ are identical.