3-7 Additional Practice

Transformations of Polynomial Functions

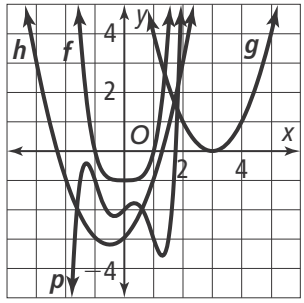
Use the equations to determine whether a function is odd, even, or neither.

1. $f(x) = x^5 + 2x^4 + 3x - 14$ **Neither**

2. $f(x) = -x^6 + 2x^2 + 3$ **Even**

3. $f(x) = x^{11} + 11x^9 - 11x$ **Odd**

4. Determine whether the functions with graphs f, g, h, and p are odd, even, or neither.



***f*: even; *g*: even; *h*: neither; *p*: odd**

5. How do the graphs of the functions $g(x) = 3x^4 - 5$ and $h(x) = 3x^4 + 5$ compare to their parent functions?

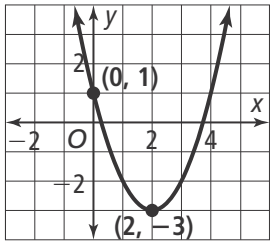
Parent of $g(x)$ moved 5 units downward. Parent of $h(x)$ moved 5 units upward.

6. Tennis balls are made to certain specifications but are allowed certain variances. For example, its weight can be from 1.975 to 2.095 ounces. However, tennis ball manufacturers use the formula, $V = \frac{4}{3}\pi r^3$, where R is the radius of the ball in millimeters. If one centimeter = 10 millimeters, then what function defines the volume of the tennis ball with a radius of R centimeters long in terms of millimeters? $V = \frac{4000}{3}\pi r^3$; where r is in millimeters

7. The annual profit of a company is equal to the difference between annual revenue and total annual expenses of the company. The annual revenue of the company is defined by the function $R(x) = 6x^4 - 4x^2 + 11$ and the annual total expenses of the company is defined by the function $C(x) = 4x^4 - 2x^3 - 6x^2 + x$. What function defines the annual profit of the company?

$P(x) = 2x^4 + 3x^3 - x + 11$

8. The graph at the right is a transformation of a parent quadratic function.



   a. Describe the steps used to determine the equation of this graph. **Sample answer: The vertex of the parent function is at (0, 0), which is transformed to (2, −3). That is, the function moved 2 units to the right, and then 3 units downward.**

   b. Determine the equation of the transformed function.

$g(x) = (x - 2)^2 - 3$