Assignment : Transformation of Graphs

Describe the transformations necessary to transform the graph of $f(x)$ into that of $g(x)$.

1) $f(x) = x^3$
   $g(x) = (x - 3)^3 + 3$

2) $f(x) = x^2$
   $g(x) = \frac{1}{3}(x - 1)^2$

3) $f(x) = x^3$
   $g(x) = (x + 1)^3 + 2$

4) $f(x) = x^2$
   $g(x) = (x + 3)^2 - 2$

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

6) $f(x) = x^2$
   $g(x) = (x + 1)^2 - 3$

7) $f(x) = \frac{1}{x}$

   $g(x) = \frac{3}{x} - 3$

8) $f(x) = x^2$
   $g(x) = -x^2 + 2$

Transform the given function $f(x)$ as described and write the resulting function as an equation.

9) $f(x) = x^3$
   reflect across the x-axis
   translate up 2 units

10) $f(x) = \frac{1}{x}$
    reflect across the x-axis
    translate down 3 units

11) $f(x) = x^3$
    reflect across the x-axis
    translate right 3 units

12) $f(x) = x^3$
    expand vertically by a factor of 3
    translate right 1 unit

13) $f(x) = x^3$
    compress vertically by a factor of 2
    reflect across the x-axis

14) $f(x) = x^2$
    compress horizontally by a factor of 2
    translate down 2 units

Answers to Assignment : Transformation of Graphs

1) translate right 3 units
   translate up 3 units

2) compress vertically by a factor of 3
   translate right 1 unit

3) translate left 1 unit
   translate up 2 units

4) translate left 3 units
   translate down 2 units

5) reflect across the x-axis
   translate right 2 units

6) translate left 1 unit
   translate down 3 units

7) expand vertically by a factor of 3
   translate down 3 units

8) reflect across the x-axis
   translate up 2 units

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

10) $g(x) = -\dfrac{1}{x} - 3$

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

12) $g(x) = 3(x - 1)^3$

13) $g(x) = -\dfrac{1}{2}x^3$

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