Functions

Problem

Two students are given the function $f(x) = x^3$ and asked to graph the transformation

$$f(-2x + 1) - 2.$$

Student A reflected the graph of $f(x)$ about the y-axis, compressed it horizontally by a factor of 2, shifted it to the left 1 unit and down 2 units, in that order.

Student B shifted the graph of $f(x)$ to the right 1 unit, compressed it horizontally by a factor of 2, reflected it about the y-axis and shifted it down 2 units, in that order.

(a) Student *A* has the correct graph.

(b) Student *B* has the correct graph.

(c) Both student *A* and student *B* have the correct graph.

(d) Neither student *A* nor student *B* have the correct graph.

Answer: (d) This is a good in-class assessment. Could plan for a long discussion, in which students write correct directions to graph the given function and determine equations for the functions graphed by student *A* and student *B*.