

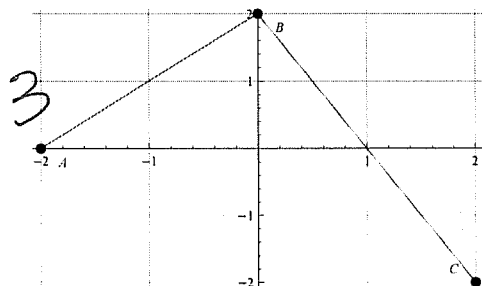
90 pts.

Assignment #3

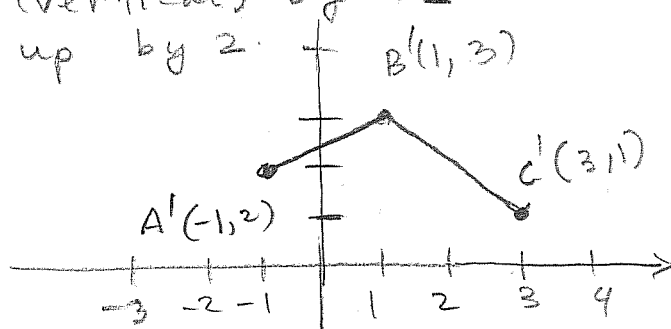
Name Answer Key

Due 25 September 2009

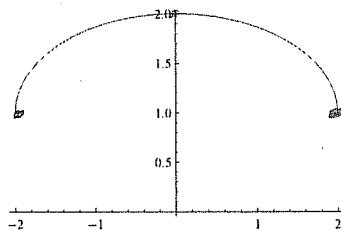
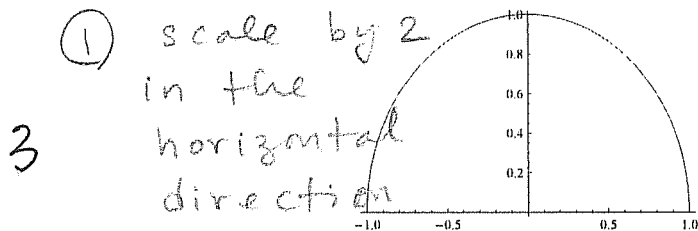
1. The graph of a function f is given below. Sketch the graph of $y = \frac{1}{2}f(x-1) + 2$. Indicate the locations of the points A , B , and C under this transformation.



- ① shift right by 1
- ② scale (vertical) by $\frac{1}{2}$
- ③ shift up by 2



2. The graph of $y = f(x) = \sqrt{1-x^2}$ is shown below on the left. On the right is a transformation of this graph; find an expression for this transformed function.



- ② shift up by +1 in the vertical direction

$$y = f\left(\frac{x}{2}\right) + 1$$

$$y = \sqrt{1 - \left(\frac{x}{2}\right)^2} + 1$$

3. Let $f(s) = \frac{s+2}{2s+3}$ and $g(s) = \frac{3s+5}{8s+4}$. Find simple expressions for $f \circ g$ and $g \circ f$.

$$2 f(g(s)) = \frac{\left(\frac{3s+5}{8s+4}\right) + 2}{2\left(\frac{3s+5}{8s+4}\right) + 3} = \frac{3s+5 + 2(8s+4)}{2(3s+5) + 3(8s+4)} = \frac{19s + 13}{30s + 22}$$

$$2 g(f(s)) = \frac{3\left(\frac{s+2}{2s+3}\right) + 5}{8\left(\frac{s+2}{2s+3}\right) + 4} = \frac{3(s+2) + 5(2s+3)}{8(s+2) + 4(2s+3)} = \frac{13s + 21}{16s + 28}$$