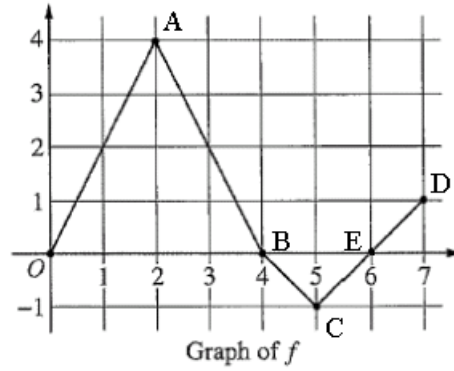
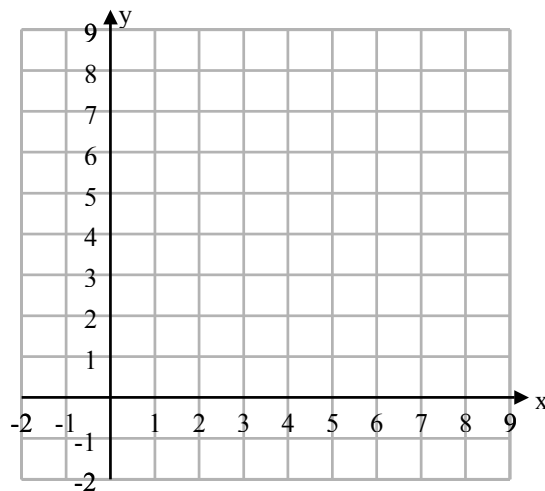


Adaptation of 2003 Calculus AB Form B question 5 for Geometry (1)



- Find the slope of $f(x)$ if $0 \leq x \leq 2$.
- Segments \overline{OA} and \overline{AB} are not perpendicular; however, segments \overline{BC} and \overline{CE} are perpendicular. Justify that this is a true statement.
- Find the length of the segment \overline{OA} .
- Graph $h(x) = f(x) + 1$. Label the points on the new graph as O', A', B', C', D', E' . Title the graph as "Graph of h ".



5. What is the slope of $h(x)$ if $0 \leq x \leq 2$? Explain your reasoning.

6. What statement can you make about the slopes and the lengths of the segments \overline{OA} and $\overline{O'A'}$, \overline{AB} and $\overline{A'B'}$, \overline{BC} and $\overline{B'C'}$, \overline{CE} and $\overline{C'E'}$, as well as \overline{ED} and $\overline{E'D'}$?

7. $h(x)$ represents a translation of f up one unit. Write the equation of a new function $g(x)$ that will translate f down 2 units.

8. Explain why the statements that were made in question 6 will also be true for the corresponding segments of the new function g . Generalize your statement for any function $m(x) = f(x) + k$.

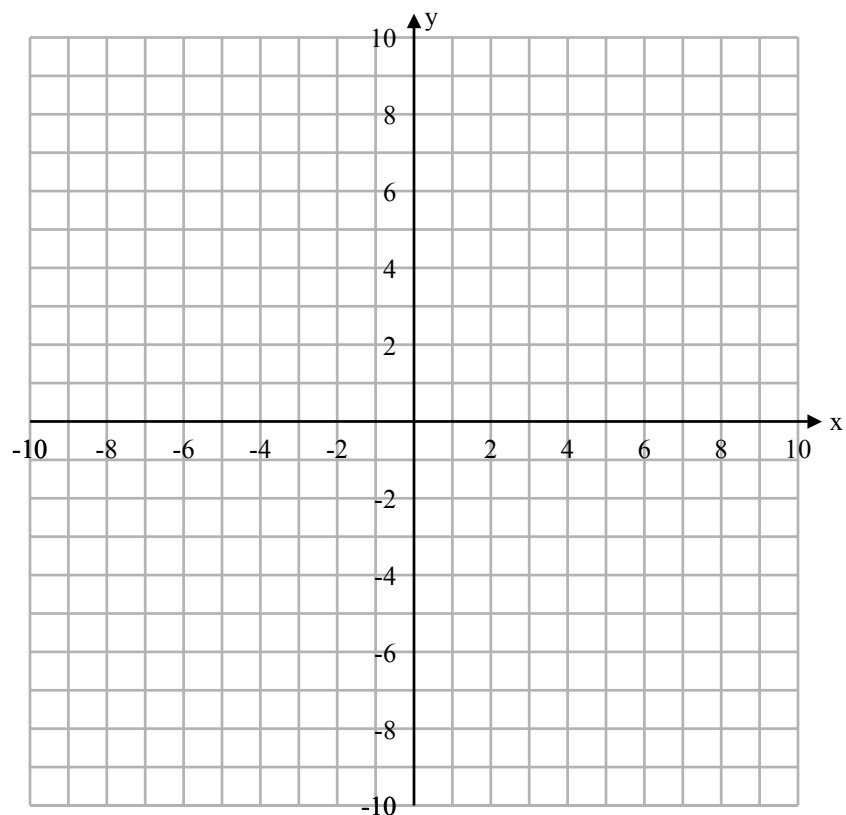
9. Write an equation for a new function $p(x)$ in terms of $f(x)$ that will translate f two units to the right.

10. Write a conjecture about the slopes and the lengths of segments of corresponding segments that have been translated vertically or horizontally.

11. Segment \overline{AB} is a reflection of segment \overline{OA} about which vertical line?

12. Find the slope of \overline{AB} and compare it to the slope of \overline{OA} that you calculated in question 1.

13. Compare the slopes of segment \overline{BC} and \overline{CE} . These two segments are also reflections of each other about the vertical line $x = 5$.
14. Use your results from questions 12 and 13 to make a conjecture about the slopes of segments that are reflections about a vertical line.
15. Draw a new function $k(x)$ that is reflection of $f(x)$ about the y -axis. Write an equation in terms of $f(x)$ for $k(x)$.



16. Using the grid provided in question 15, draw a new function $m(x)$ that is reflected about the x -axis. Write an equation in terms of $f(x)$ for $m(x)$.

