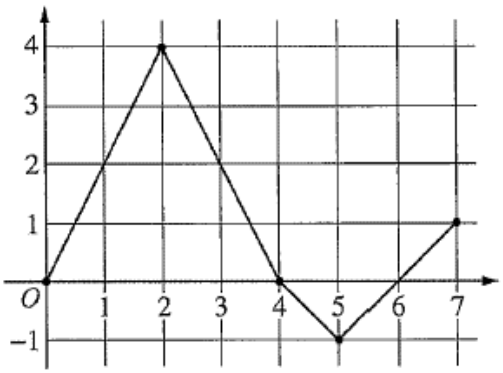
Adaptation of 2003 Calculus AB Form B question 5 for Algebra 2/Precalculus



Graph of f

Let f be a function defined on the closed interval [0, 7]. The graph of f, consisting of four line segments, is shown above.

1. Write the piecewise function for $f(x)$.

2. Find the values of x for which $f(x) = 1$.

3. For what interval(s) of x does f have a rate of change of 2? Explain your answer.

4. On which interval of x is the rate of change of f the greatest? Justify your answer.

For questions 5 – 8, express, in terms of the function *f*, a function *g* that will have the following characteristics:

5. The maximum value of *g* is located at the point (2,5).

6. The maximum value of *g* is located at the point (2,2).

7. The minimum value of *g* is located at the point (2, -4).

8. The range of *g* is [0,4].

Each of the following transformations on the function *f* will change the point at which the maximum value of the function *f* will occur. Given that $k > 1$, explain the effect of each transformation.

9. $g(x) = f(x) + k$

10. $g(x) = f(x - k)$

11. $g(x) = k \cdot f(x)$

12. $g(x) = f(kx)$