

- 1. Write an equation for the graph of y = f(x) obtained by the given transformation:
 - (a) Shift 1 upward
 - (b) Shift 2 downward
 - (c) Shift 3 to the right
 - (d) Shift 4 to the left
 - (e) Reflect about the x-axis
 - (f) Reflect about the y-axis
 - (g) Stretch horizontally by a factor of 5
 - (h) Shrink horizontally by a factor of 6
- 2. Find a function resulting from reflecting $f(x) = x^2 x$ about the line x = 2.
- 3. Find a function resulting from reflecting $f(x) = 2^x$ about the line y = 3.
- 4. A portion of the graph of $y = x \ln x$ is shown



Use transformations to create a function that has the following graph:



- 5. Graph $y = \sqrt{2-x}$ by hand
- 6. Graph $y = |x^2 1|$ by hand



- 7. Let $f(x) = \sqrt{x+2}$ and $g(x) = \ln(x^2 3)$. Find and state the domain of:
 - (a) f + g
 - (b) f g
 - (c) fg
 - (d) f/g

8. Let $f(x) = \sqrt{x+2}$ and $g(x) = \ln(x^2 - 3)$. Find and state the domain of:

- (a) $f \circ g$
- (b) $g \circ f$
- (c) $f \circ f$
- (d) $f \circ g$
- 9. Express the function $P(x) = \ln(\sqrt{x} + 3)$ in the form $f \circ g \circ h$
- 10. An airplane is traveling parallel to the ground at a speed of 600 mph. The plane is at an altitude of 6 miles, and flies directly over your head at noon.
 - (a) Let s be the distance between you and the airplane (assume you are standing still), and let d be the distance the airplane has traveled. Find a function f such that s = f(d).
 - (b) Let t be the number of hour elapsed since noon. Find a function g such that d = g(t).
 - (c) Find $f \circ g$. What does this function represent?