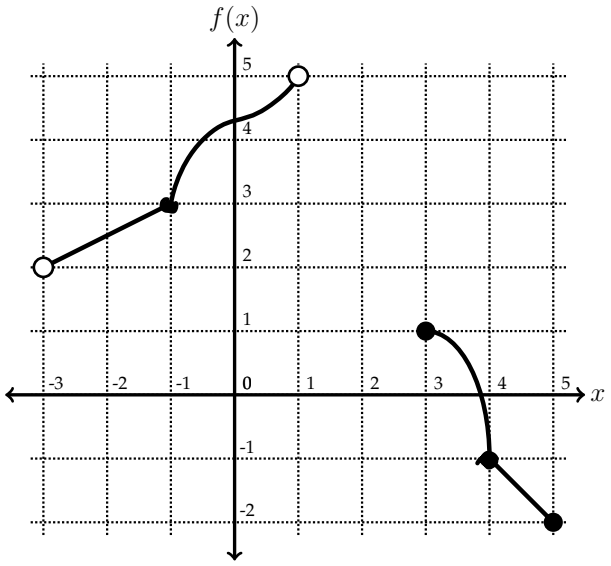
Problem 1 Let $f(x) = -(x-1)^2 + 10$ and $g(x) = \frac{x}{x+1}$.

a)(5 points) Compute $f(g(x))$

b)(5 points)Find an inverse for $f(x)$ on the domain $x \leq 1$

c)(5 points)Suppose that $f(x)$, for $0 \leq x \leq 1$, gives you the altitude, at time x, of a ball that has been launched in the air. Time x is measured in seconds and altitude $f(x)$ in meters. Explain in words the meaning of $f^{-1}(0.5)$ (You do not need to compute the value of $f^{-1}(0.5)$)

1. Happy Thursday! I bought you this graph.

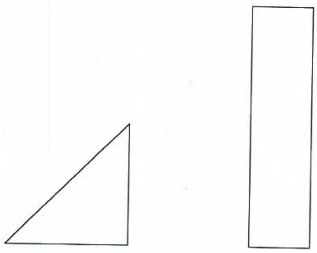


(a) **[4 points]** Compute $f(f(f(4)))$.

(b) **[5 points]** Find the domain and range of $f^{-1}(x)$.

(c) **[5 points]** Let $g(x) = f(2x + 1) + 1$. Find the domain and range of $g(x)$.

3. You have 1000 meters of fencing with which to build two enclosures. One enclosure will be an isosceles right triangle, and the other will be a rectangle that is four times as long as it is wide. The figure below shows the two shapes.



What should the dimensions of the rectangular enclosure be to **minimize** the combined total area of the two enclosures?

$1000

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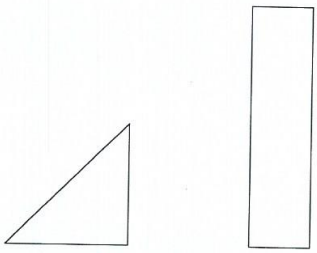

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