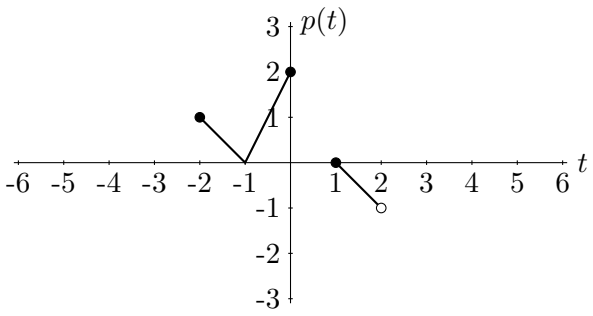
1. [21 points] Consider $h(w)$, a function with domain $[-7, 6]$, with values given in the table below.

w	-7	-5	-2	0	2	6
$h(w)$	20	10	1	-3	-5	-7

Consider the piecewise function

$$j(x) = \begin{cases} 2x + 9 & \text{for } -7 \leq x < -2 \\ 20 \cdot 2^x & \text{for } -2 \leq x \leq 6. \end{cases}$$

Finally, consider the function $p(t)$ with graph:



a. [5 points] Circle all of the following statements that COULD be true. Circle the whole statement. Any unclear marks will be marked incorrect.

$h(w)$ is invertible. $h(w)$ is concave down. $h(w)$ is exponential.

$h(w)$ is increasing. $h(w)$ is decreasing. $h(w)$ is linear.

$h(w)$ has two horizontal intercepts. $h(w)$ has a positive vertical intercept.

b. [4 points] Find the domain of $p(t)$ and the range of $j(x)$. Express your answer in interval notation or using inequalities.

The domain of $p(t)$ is _____

The range of $j(x)$ is _____

c. [4 points] Calculate the following or write "UNDEFINED" if the quantity is not defined. Simplify your answer.

(i) $j(2) =$ _____

(ii) $(2p(2) - 1)^2 =$ _____

(iii) $j(h(2)) =$ _____

(iv) $p(j(-4))$ _____

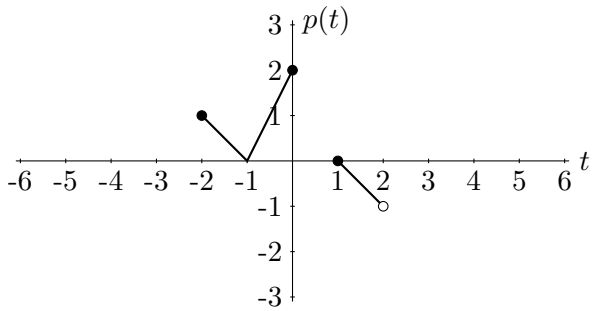
1. (continued) The information given on the previous page is given again here for your convenience:
Consider $h(w)$, a function with domain $[-7, 6]$, with values given in the table below.

w	-7	-5	-2	0	2	6
$h(w)$	20	10	1	-3	-5	-7

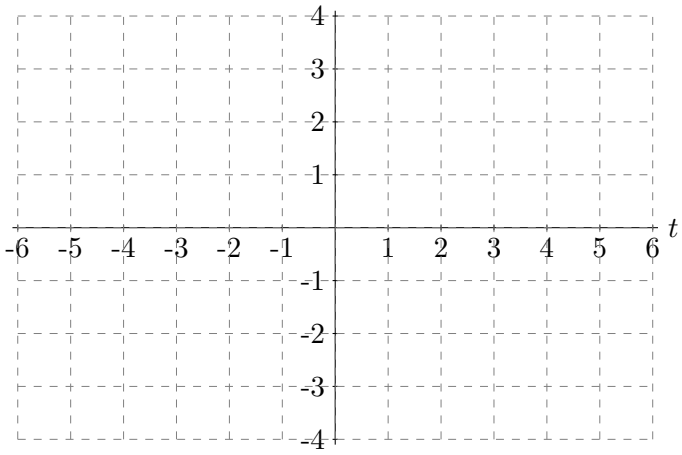
Consider the piecewise function

$$j(x) = \begin{cases} 2x + 9 & \text{for } -7 \leq x < -2 \\ 20 \cdot 2^x & \text{for } -2 \leq x \leq 6. \end{cases}$$

Finally, consider the function $p(t)$ with graph:



d. [4 points] Carefully sketch a graph of $p(t-2)-1$ on the axes below. Be sure to make the coordinates of all endpoints of the function clear.



e. [4 points] Find all solutions to each of the equations below. Simplify your answers, but leave them in **exact** form. If an equation has no solution, write "NO SOLUTION" in the blank.

(i) $j(h(w)) = -5$.

$w =$ _____

(ii) $p(t) = 1$.

$t =$ _____