

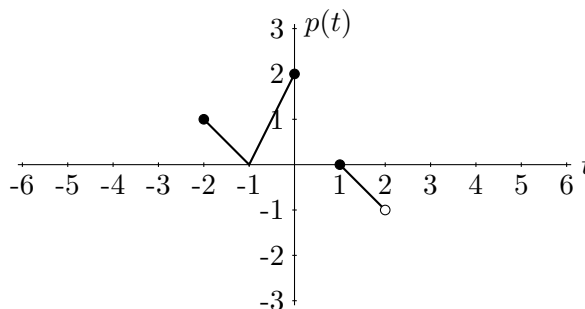
1. [21 points] Consider $h(w)$, a function with domain $[-7, 6]$, with values given in the table below.

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 $[-2, 0] \cup [1, 2)$

The range of $j(x)$ is $[-5, 5) \cup [5, 20 \cdot 2^6]$

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

(i) $j(2) =$ 80

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

(iii) $j(h(2)) =$ -1

(iv) $p(j(-4)) =$ 0

1. (continued) The information given on the previous page is given again here for your convenience:

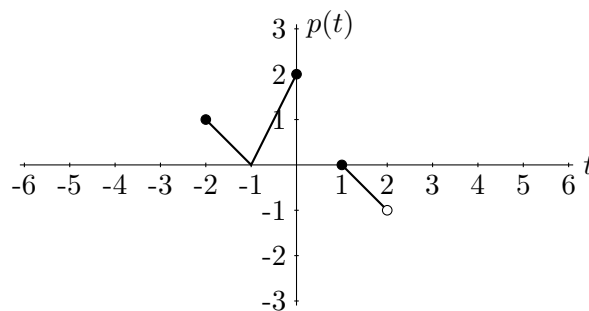
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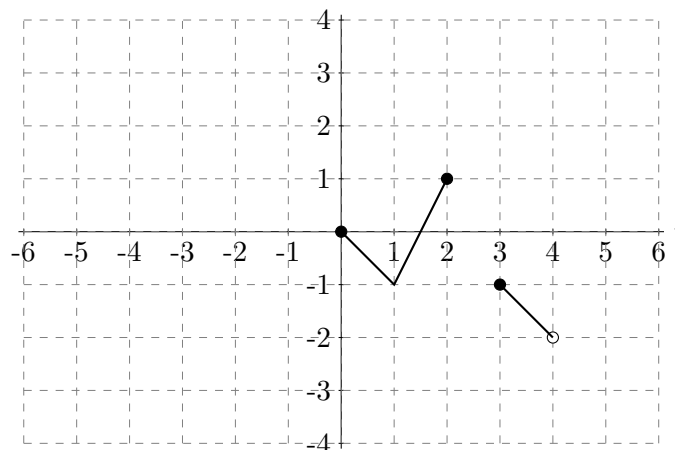
Consider the piecewise function

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

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

$w = \underline{\quad 6 \quad}$

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

$t = \underline{\quad -2, -1/2 \quad}$