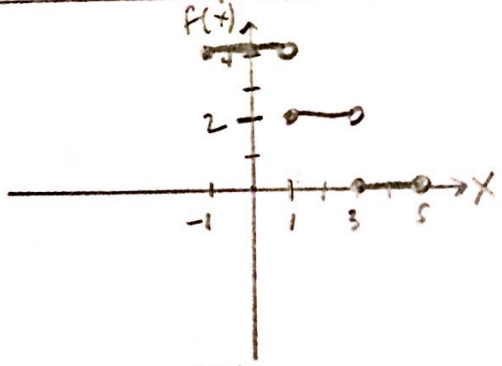
MATHS
SN

Greatest Integer, Quadratic, Piecewise Functions

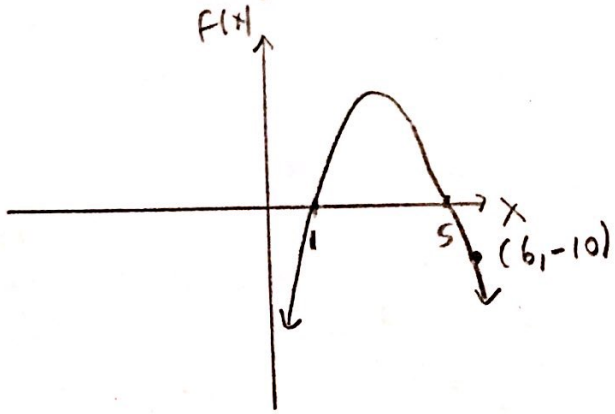
Pretest

① Find the rules and perform a complete study of:

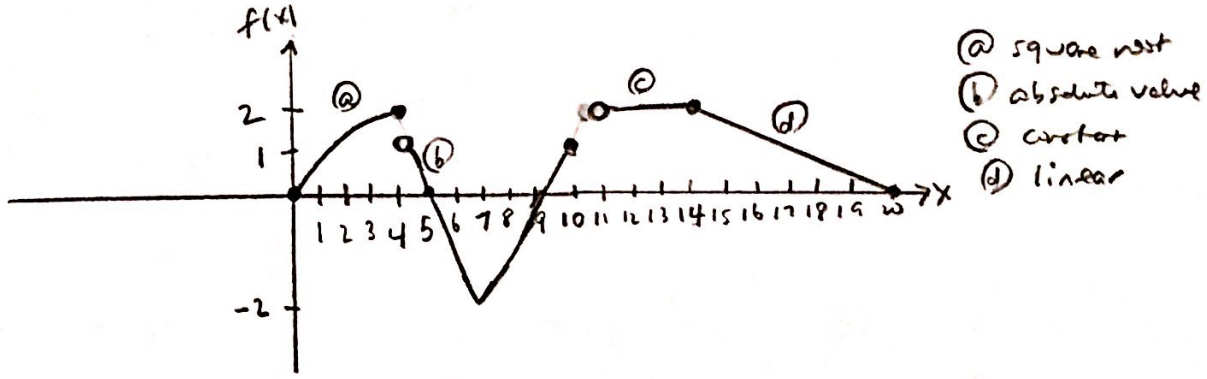
a)



b)



c)



② Graph:

$$f(x) = \begin{cases} -2\sqrt{-x} & \text{if } x \le 0 \\ -|x-2|+4 & , 0 < x \le 4 \\ (x-5)^2 - 1 & , 4 < x < 6 \\ 6 & , x \ge 6 \end{cases}$$

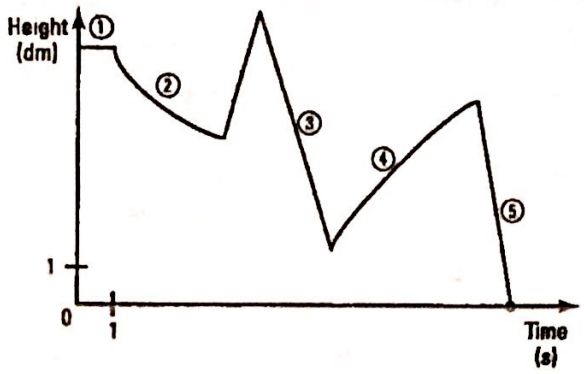
③ $f(x) = 2[x - \frac{1}{2}]$ $\quad g(x) = |3x+1|$ $\quad h(x) = (x-3)^2 + 1$

$h \circ g \circ f(0) =$

$f(g(h(1))) =$

(4)

The path of a marble in a child's game can be represented by the graph in the Cartesian plane below. Initially, the marble is at a height of 7 dm from the ground.

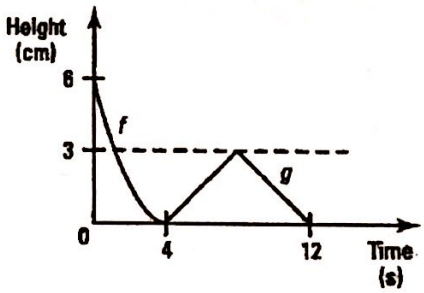


$$f(x)=\begin{cases}7 & \text{if } 0\leq x<1\\ \frac{3}{x}+4 & \text{if } 1\leq x\leq 4\\ a|x-5|+8 & \text{if } 4\leq x\leq 7\\ 2\sqrt{x-7}+k & \text{if } 7\leq x\leq 11\\ -5.5x+b & \text{if } 11\leq x\leq t\end{cases}$$

Determine the duration t of the marble's path.

(5)

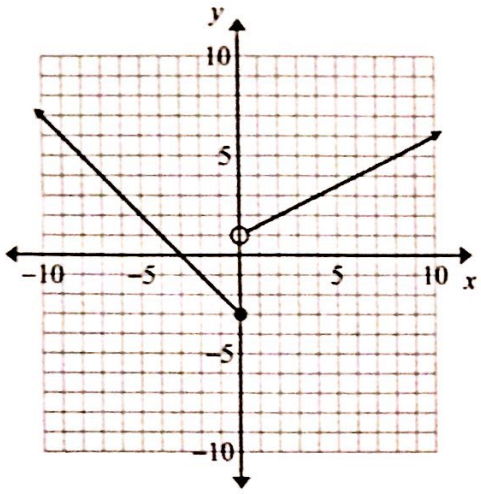
Aaron is playing an electronic game. The height of a flashing dot on the screen can be modeled by a square root function f from 0 to 4 seconds and by an absolute value function g from 4 to 12 seconds as indicated by the graph on the right.



The starting point of the flashing dot is the vertex of the function f.

Determine at what times the flashing dot is at a height of 1.5 cm.

6. Which function is represented by the graph?



A. $f(x)=\begin{cases}-x-3, & \text{if } x\le 0\\ \frac{1}{2}x+1, & \text{if } x>0\end{cases}$

B. $f(x)=\begin{cases}x-3, & \text{if } x\le 0\\ -\frac{1}{2}x+1, & \text{if } x>0\end{cases}$

C. $f(x)=\begin{cases}-x+3, & \text{if } x\le 0\\ \frac{1}{2}x+1, & \text{if } x>0\end{cases}$

D. $f(x)=\begin{cases}x+3, & \text{if } x\le 0\\ -\frac{1}{2}x+1, & \text{if } x>0\end{cases}$