

## ROUND 1

1. Is the relation  $\{(2,5), (3,6), (4,7), (2,2)\}$  a function? Explain.
2. Given the function  $f(x) = x^2 - 3x + 2$ , find  $f(4)$ .
3. Find  $f(x - 3)$  for the same function above.
4. Let  $g(t) = \sqrt{2t + 12}$ . Name one number  $c$  such that  $g(c)$  does not exist.

## ROUND 3

9. If  $P(x) = x^2$  and  $Q(x) = 2x + 1$ , then find  $(P \circ Q)(1)$
10. If  $P(x) = x^2$  and  $Q(x) = 2x + 1$ , then find  $(Q \circ Q)(x)$
11. Find functions  $f$  and  $g$  such that  $f(g(x)) = \sqrt[3]{2x^2 + 1}$
12. Find functions  $f$  and  $g$  such that  $f(g(x)) = 5 \sin^2 x$

## ROUND 2

5. Find the domain of the function  $f(x) = \frac{1}{x+5}$
6. Find the domain of the function  $g(x) = \sqrt{2x + 1}$
7. Find the domain of the function  $h(x) = 2x^2 - 6x$
8. Find the domain of the function  $K(t) = \frac{1}{\sqrt{t+2}}$

## ROUND 4

13. Create a function that is undefined at  $x = 3$ , but is defined everywhere else.
14. Let  $f(x) = \frac{x^2 - 4}{x - 2}$ . Simplify it, and state whether it is defined at  $x = 2$ .
15. Let  $f(x) = \begin{cases} x^2, & \text{if } x \leq 0 \\ 2x + 1, & \text{if } x > 0 \end{cases}$ . Find  $f(-1), f(0), f(5)$