

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 $f(-1), f(0), f(5)$