

FUNCTIONS – journal questions – MCR

Summarize everything you need to know about these topics. Use examples and concise (not long – but with enough detail) explanations. Include definitions and diagrams if necessary

1. RELATIONS and FUNCTIONS

Definitions of relations & functions. Talk about Vertical Line Test for graphs. Talk about what is the key feature of the equation that gives it away that the relation will not be a function. Include examples of both functions and non-functions (graphs, equations, mapping diagrams, sets of ordered pairs, real-life scenarios).

2. FUNCTION NOTATION

- Discuss how the notation may be confused with multiplication, talk about what you should think of instead.
- Show how to evaluate and simplify equations with different inputs.

$$f(x) = 2(x + 1)^2 - 5$$

- $f(3) - f(0)$

- $2f(5) - 2$

- $f(v) + f(6 - v)$

expand and collect like terms in the end

- Include a discussion of how to rearrange the area of a trapezoid formula for height as a function of area.

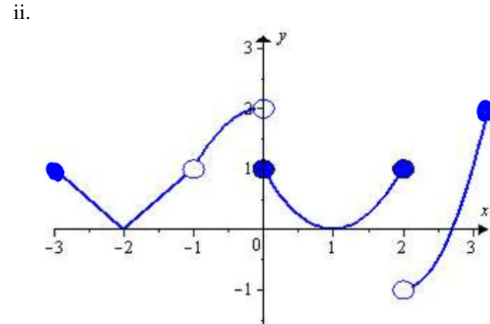
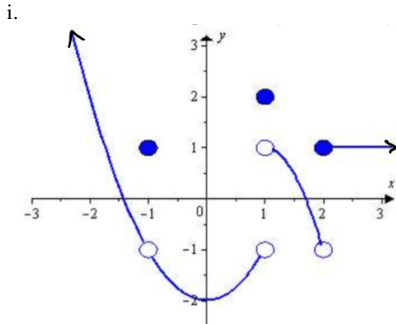
3. DOMAIN & RANGE

- Explain the symbols used in SET NOTATION. Shade in the values on a number line. Which one of these can you also write in INTERVAL NOTATION? Show how.

- $\{x \in \mathbb{R} \mid x < 1 \cup 4 \leq x < 6\}$

- $\{x \in \mathbb{Z} \mid -4 \leq x < 3 \cap 0 < x \leq 6\}$

- Define domain and range. Then explain how to find both domain and range from a graph (use both set notation and interval notation)



- Find domain from equation $f(x) = \frac{\sqrt{6-2x}}{x^2+7x}$ (use both set notation and interval notation). Make a note that range is hard to do on equations without seeing the graph.

4. NEW FUNCTIONS

Copy/Paste the functions from assignment into your journal. List A is needed for this unit. List B is needed later.

5. TRANSFORMATIONS

- Create a summary of what each constant controls in $y = af(k(x-d)) + c$.

Notes to add:

- Factor out the coefficient of x first, otherwise horizontal shift is not visible (ie. There must be a bracket between k number and x)
- If you are just doing a quick sketch (ie. when scale is not shown on graph) just do reflections and shifts and skip stretches and compressions

- Identify the parent function and the transformations applied from an equation $f(x) = -0.5|3x - 6| + 8$. Sketch and explain how to use image points.

- Find the transformations of $y = -3x^2 + 6x$, what must be done first? Do a quick sketch without worrying about scale.

- Discuss why you must always apply stretch/compress/reflect before shifts

6. INVERSES

- Notation f^{-1} is not a negative exponent, explain. Compare to x^{-1} . Discuss what $f^2(x)$ or $\sin^2 \theta$ actually means.

- Definition of ONE TO ONE FUNCTION. Show examples and counterexamples.

- Definition of INVERSE function. Discuss informal, formal, graphical representations of inverses

- Find inverse function $f(x) = 2x^2 - 4x + 9$ include domain restriction discussion to ensure everything is one-to-one. Show sketches to help explain your work.

Please add a note that when you switch x and y you must state that what you're finding is the inverse, ie. Once the swap happened, it is not the same as the original function in the line above anymore.