|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | Mathematics 3200  Chapter 1 Test - Function Transformations | | | |  | |
|  | | | Version 2 | | | |
|  | | | | | | | | |
| NAME:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | | | | | |
|  | | | | | | | | |
| SECTION A: Selected Response: Place the LETTER of your response in the \_\_\_\_ at the right. [17 points] | | | | | | | | |
|  | | | | | | | | |
|  | | | | | | | | |
| 1. | The function is stretched vertically by a factor of 3 and is translated 4 units to the left. What is the equation of the transformed function? | | | | | | | 1.\_\_\_\_\_\_\_\_ |
|  |  |  | |  |  | | | |
|  | A |  | | B |  | | | |
|  | C |  | | D |  | | | |
|  |  |  | |  |  | | | |
| 2. | The graph of contains P(-2, 6). What are the coordinates of the image of this point on the function ? | | | | | | | 2.\_\_\_\_\_\_\_\_ |
|  |  |  | |  |  | | | |
|  | A |  | | B |  | | | |
|  | C |  | | D |  | | | |
|  |  |  | |  |  | | | |
| 3. | The mapping rule is applied to the function . What is the equation of the resulting function? | | | | | | | 3.\_\_\_\_\_\_\_\_ |
|  |  |  | |  |  | | | |
|  | A |  | | B |  | | | |
|  | C |  | | D |  | | | |
|  |  |  | |  |  | | | |
| 4. | The point is on the graph of the function . What are the coordinates of the image of this point on the graph of ? | | | | | | | 4.\_\_\_\_\_\_\_\_ |
|  |  |  | |  |  | | | |
|  | A |  | | B |  | | | |
|  | C |  | | D |  | | | |
|  |  |  | |  |  | | | |
| 5. | The function is transformed to produce . Which describes the transformations that are required? | | | | | | | 5.\_\_\_\_\_\_\_\_ |
|  |  |  | |  |  | | | |
|  | A | A reflection in the y-axis and a vertical stretch by a factor of 3. | | | | | | |
|  | B | A reflection in the x-axis and a vertical stretch by a factor of 3. | | | | | | |
|  | C | A reflection in the y-axis and a vertical stretch by a factor of | | | | | | |
|  | D | A reflection in the x-axis and a vertical stretch by a factor of | | | | | | |
|  |  | | | | | | |  |
| 6. | Which mapping rule would map the function onto the function  ? | | | | | | | 6.\_\_\_\_\_\_\_\_ |
|  |  |  | |  |  | | | |
|  | A |  | | B |  | | | |
|  | C |  | | D |  | | | |
|  |  |  | |  |  | | | |
| 7. | Which would produce a graph with the same x-intercepts as the graph of ? | | | | | | | 7.\_\_\_\_\_\_\_\_ |
|  |  |  | |  |  | | | |
|  | A |  | | B |  | | | |
|  | C |  | | D |  | | | |
|  |  |  | |  |  | | | |
| 8. | The domain of is . What is the domain of  ? | | | | | | | 8.\_\_\_\_\_\_\_\_ |
|  |  |  | |  |  | | | |
|  | A |  | | B |  | | | |
|  | C |  | | D |  | | | |
|  |  |  | |  |  | | | |
| 9. | The function is reflected in the x-axis and is translated 5 units down. What is the equation of the transformed function? | | | | | | | 9.\_\_\_\_\_\_\_ |
|  |  |  | |  |  | | | |
|  | A |  | | B |  | | | |
|  | C |  | | D |  | | | |
|  |  |  | |  |  | | | |
| 10. | If , what are the zeroes of the function ? | | | | | 10.\_\_\_\_\_\_\_\_ | | |
|  |  |  | |  |  | | | |
|  | A | and | | B | and | | | |
|  | C | and | | D | and | | | |
|  |  |  | |  |  | | | |
| 11. | The graph of is shown. Which is an invariant point under the transformation ? | | | | | 11.\_\_\_\_\_\_\_\_ | | |
|  |  |  | |  |  | | | |
|  | A |  | |  |
|  | B |  | |  |
|  | C |  | |  |
|  | D |  | |  |
|  |  |  | |  |
|  |  | | | | |  | | |
|  |  | | | | |  | | |
| 12. | The function contains the point . It is transformed by applying the following transformations in the order listed. What is the resulting image of point P?   * Reflection in the x-axis * Translated 2 units to the left and 3 units up * Stretched vertically by a factor of 2 * Translated 1 unit right and 1 unit up * Stretched horizontally by a factor of 3 | | | | | 12.\_\_\_\_\_\_\_\_ | | |
|  |  |  | |  |  | | | |
|  | A |  | | B |  | | | |
|  | C |  | | D |  | | | |
|  |  |  | |  |  | | | |
| 13. | Which mapping rule would map onto ? | | | | | 13.\_\_\_\_\_\_\_\_ | | |
|  |  |  | |  |  | | | |
|  | A |  | | B |  | | | |
|  | C |  | | D |  | | | |
|  |  |  | |  |  | | | |
| 14. | The mapping rule is applied to to produce a function of the form . Which values are correct for ? | | | | | 14.\_\_\_\_\_\_\_\_ | | |
|  |  |  | |  |  | | | |
|  | A |  | | B |  | | | |
|  | C |  | | D |  | | | |
|  |  |  | |  |  | | | |
| 15. | The graph of is shown. Which represents the graph of ? | | | | | 15.\_\_\_\_\_\_\_\_ | | |
|  |  |  | | | | | | |
|  | A |  | | B |  | | | |
|  | C |  | | D |  | | | |
|  |  |  | |  |  | | | |
| 16. | Which mapping rule would map onto ? | | | | | 16.\_\_\_\_\_\_\_\_ | | |
|  |  |  | | | | | | |
|  | A |  | | B |  | | | |
|  | C |  | | D |  | | | |
| 17. | What is the inverse of g? | | | | | 17.\_\_\_\_\_\_\_\_ | | |
|  |  |  | |  |  | | | |
|  | A |  | | B |  | | | |
|  | C |  | | D |  | | | |
|  |  |  | |  |  | | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SECTION B: Constructed Response: Answer ALL questions in the space provided. Full credit will only be awarded for correct **solutions.** | | | | | | | | | | | | | |
|  |  | | | | | | | | | | | | |
| 1. | The graph of is a transformation of . | | | | | | | | | | | | |
|  | (a) | | | List the transformations required to map onto g | | [2 pts] | | | PC12 tech art BLM 1–3-2 | | | | |
|  |  | | |  | | | | |
|  |  | | |  | | | | |
|  | (b) | | | Write the mapping rule. | | [1 pt] | | |
|  |  | | |  | | | | |
|  |  | | |  | | | | |
|  |  | | |  | | | | |
|  | (c) | | | Determine the equation of in the form | | [1 pt] | | |
|  |  | | |  | | | | |
|  |  | | |  | | | | |
|  |  | | |  | | | | |
|  |  | | | | | | | |  | | | | |
|  |  | | | | | | | |  | | | | |
| 2. | The graph of a function is shown below. | | | | | | | |  | | | | |
|  | (a) | On the same grid, sketch the graph of the function that results when the mapping rule is applied to this function. | | | | [2 pts] | | |  | | | | |
|  | (b) | Write the equation of the resulting function in the form  . | | | | [1 pt] | | |  | | | | |
|  |  | | | | | | | |  | | | | |
|  |  | | | | | | | |  | | | | |
|  | . | | | | | | | | | | | | |
|  |  | | | | | | | | | | | | |
|  |  | | | | | | | | | | | | |
|  |  | |  | | | | | | | | | | |
|  |  | |  | | | | | | | | | | |
|  |  | |  | | | | |  | |  | | | |
|  |  | |  | | | | | | | | | | |
|  |  | |  | | | | |  | |  | | | |
|  | 3. | | The function is transformed to produce . | | | | | | | | | | |
|  |  | | 1. Write the mapping rule that maps onto . | | | | [2 pts] | | | |  | | |
|  |  | | 1. Sketch the graphs of both functions on the grid provided, clearly showing at least 5 points on each function. | | | | [3 pts] | | | |  | | |
|  |  | | 1. Write the equation that represents . | | | | [2 pts] | | | |  | | |
|  |  | |  | | | | | | | |  | | |
|  |  | | . | | | | | | | |  | | |
|  |  | |  | | | | | | | |  | | |
|  | 4. | | (a) Algebraically determine the inverse of | | | | | | | | | | [3 pts] |
|  |  | |  | | | | |  | |  | | | |
|  |  | | (b) Restrict the domain of so that its inverse is also a function. | | | | | | | | | | [1 pt] |
|  |  | |  | | | | |  | |  | | | |
|  |  | |  | | | | |  | |  | | | |
|  |  | |  | | | | |  | |  | | | |
|  | 5. The function is transformed to produce a function of the form.  The list of transformations is given below.   * Reflected in the x-axis * Stretched vertically by a factor of 4 * Stretched horizontally by a factor of * Translated 3 units right and 5 units down. | | | | | | | | | | | | |
|  |  | | (a) | | Write the mapping rule that represents this set of transformations. | | | | | | | [2 pts] | |
|  |  | |  | |  | | | | | | |  | |
|  |  | | (b) | | Write the function in the form . | | | | | | | [1 pt] | |
|  |  | |  | |  | | | | | | |  | |
|  |  | |  | |  | | | | | | |  | |
|  |  | |  | |  | | | | | | |  | |