**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **Unit 5 Review – Functions**

**Helpful Information:**

**Function** – x-values can NOT repeat (vertical line test)

**Domain** – x-values **Range**- y-values

**One-To-One** – function in which y-values can NOT repeat (horizontal line test)

**Inverse** – $f^{-1}\left(x\right)$ – switch x and y, then solve for y

**Composition** – $f\left(g\left(x\right)\right)=\left(f ⃘g\right)\left(x\right) (f\left(f^{-1}\left(x\right)\right) used to prove inverses) $

**Transformations –** (remember x changes opposite)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Reflection** | **Dilations** | **Translations** |
| **Changes on x** | $$f\left(-x\right)$$ | $$f\left(a∙x\right)$$ | $$f\left(x+a\right)$$ |
| **Changes on y** | $$-f\left(x\right)$$ | $$a∙f\left(x\right)$$ | $$f\left(x\right)+a$$ |

**Even Functions** – symmetric about the y-axis ($f\left(x\right)=f\left(-x\right)$) \*\*Example: $y=\cos(x)$

**Odd Functions** – symmetric about the origin (180º rotation) ($-f\left(x\right)=f\left(-x\right)$) \*\*Example: $y=\sin(x)$

**Level I Practice:**

1. If  and , then  equals

|  |  |
| --- | --- |
| 1) |  |
| 2) |  |
| 3) |  |
| 4) |  |

1. Are the given functions inverses? Justify your answer.

$$f\left(x\right)=-6x$$

$$g\left(x\right)=\frac{1}{6}x$$

1. Which equation represents an odd function?

|  |  |
| --- | --- |
| 1) |  |
| 2) |  |
| 3) |  |
| 4) |  |

**Level II Practice:**

1. Given , which equation represents ?

|  |  |
| --- | --- |
| 1) |  |
| 2) |  |
| 3) |  |
| 4) |  |

1. Find $\left(f-g\right)\left(x\right)$ given that $f\left(x\right)=3x²-4$ and $g\left(x\right)=x²-8x+4$.
2. Sketch a graph of the function $y=2x³$. Is the function odd, even, or neither? Explain your answer.

**Level III Practice:**

1. If  and , then which statement is *not* true?

|  |  |
| --- | --- |
| 1) |  |
| 2) |  |
| 3) |  |
| 4) |  |

1. Which statement regarding the graphs of the functions below is *untrue*?



|  |  |
| --- | --- |
| 1) |  and  have a maximum *y*-value of 3. |
| 2) | , , and  have one *y*-intercept. |
| 3) |  and  have the same end behavior as . |
| 4) | , , and  have rational zeros. |

1. Show the inverse of a linear function $y=mx+b$, where $m\ne 0$ and $x\ne b$, is also a linear function.
2. Functions *f*, *g*, and *h* are given below. Which statement is true about functions *f*, *g*, and *h*?





|  |  |
| --- | --- |
| 1) |  and  are odd,  is even. |
| 2) |  and  are even,  is odd. |
| 3) |  is odd,  is neither,  is even. |
| 4) |  is even,  is neither,  is odd. |