**TOOLKIT FUNCTIONS**

NOTES:

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1. Perform the operations below given $f\left(x\right)=2x^{2}-3x+1$ and $g\left(x\right)=x-6$.

 a. $f(-4)$ b. $g(2)$ c. $f(g\left(3\right))$

2. Graph the piecewise function and then evaluate for the inputs listed. $f\left(x\right)=\left\{\begin{matrix}x-3 if x<-2\\x^{2 } if -2\leq x<2\\2x if x\geq 2 \end{matrix}\right.$

 $f(-5)$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_

 $f\left(-2\right)$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_

 $f(0)$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 $f(2)$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 $f(10)$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Find the inverses of the following functions:

 a. $f(x)=2x-3$ b. $f\left(x\right)=x^{2}-5$ c. $f\left(x\right)=\sqrt{x}+2$

4. Given the parent function: $y=x^{2}$, write a new function after applying the following tranformations:

 a. A reflection in the x-axis and a translation up four spaces.

 b. A vertical stretch by a factor of 3 and a translation left three spaces.

 c. A vertical compression by a factor of ½, a translation down four and right 2.

**SEQUENCES AND SERIES**

NOTES:

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1. Find the limit of each.

 a. $\frac{4n^{3}+7n^{2}}{5n^{3}-7n^{2}+3}$ b. $\frac{n^{2}-1}{n}$ c. $\frac{2n^{2}-3n}{4n^{4}}$

2. Find the 18th term of the sequence: $23, 19, 15$….

3. Find the 11th term in the sequence: 2, 6, 18…

2. Find the sum of the first 18 terms of the sequence $3-6+12-…$

3. Find the sum of the first 20 terms in the sequence $-8,1,10…$

4. Is the following series convergent or divergent? $9+8.1+7.29…$

 If it is convergent, find the sum.

5. Find the common difference for a sequence in which $a\_{1}=-4$ and $A\_{5}=32$

6. Write the first four terms of the sequence where $a\_{1}=5$ and $a\_{n}=3+a\_{n-1}$.