Topic 1

Use the function below to find the f(6) term $f(n)=3n+2$ $f(n)=2n-8$ $f(n)=-6n+5$ $f(n)=3^n$	Use the recursive formulas below to write the sequences and find the 6^{th} term $a_1=5,\ a_n=a_{n-1}+8$ $a_1=55,\ a_n=a_{n-1}-9$ $a_1=2,\ a_n=3a_{n-1}$ $a_1=5,\ a_n=a_{n-1}+8$
Jamal is planning the seating for the new auditorium. He drew 15 seats for the first row, and is planning on each following row to have 3 more seats. Write a function that can be used to solve for the number of seats Jamal will have in the n^{th} row. Write a recursive rule that would show how many seats would be in the n^{th} row. How many seats are in row 10? How many seats are there in the first 10 rows?	Jenny is collecting leaves for her science project. She collects 2 leaves on the first day, and plans on tripling that number on day two. If she continues that pattern, how many leaves will she collect on day 8? How many leaves would she have collected total on day 8? Write a recursive rule for this pattern Write the general function for the pattern
Given the first 5 terms of the sequence, write the function rule 6, 13, 20, 27, 34.... 2, 4, 8, 16, 32..... 22, 20, 18, 16, 14.... 4, 6, 9, 13.5, 20.25...	Given the first 5 terms of the sequence, write the recursive rule 6, 13, 20, 27, 34.... 2, 4, 8, 16, 32..... 22, 20, 18, 16, 14.... 4, 6, 9, 13.5, 20.25...

Topic 2: Inverses

1. a) What kind of function is the inverse of an exponential function?

   b) Write the domain and range of both an exponential function and its inverse.

2. Write the equation of the inverse of the following functions:

   a) $y = 4^x$ b) $y = 10^x$ c) $y = 25^x$ d) $y = b^x$

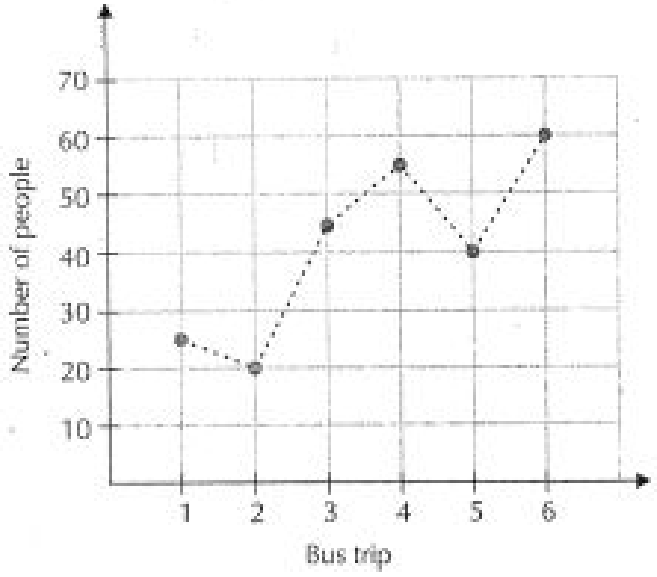
3. Write the inverse for the given table.

Number of Students	2	3	4	6	8
Number of Cookies	12	8	6	4	3

4. Find the error.

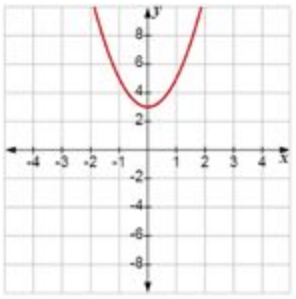
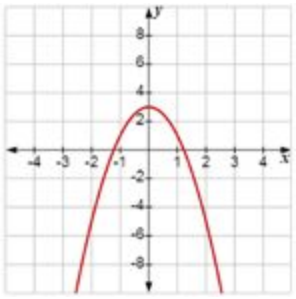
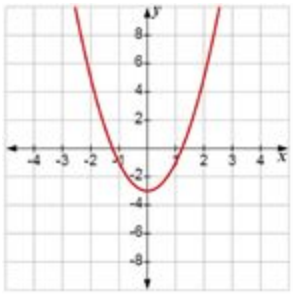
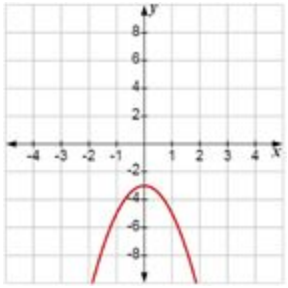
Alyssa says that the inverse of b= 5t- 2 is 5b+2= t because you switch the variables and do the opposite math.

5. Graph the inverse.

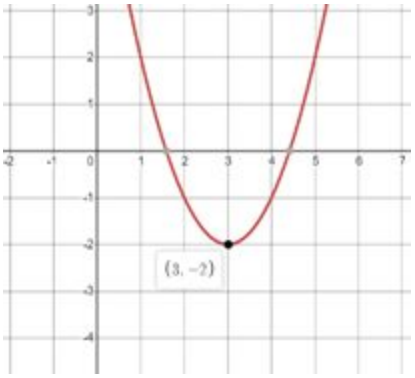


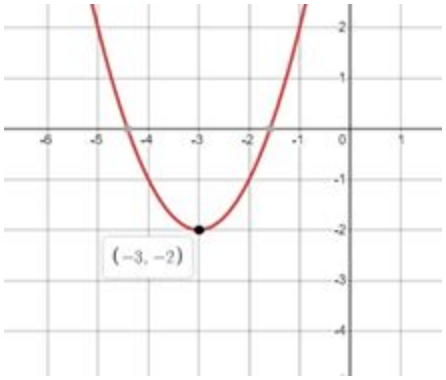
Topic 3

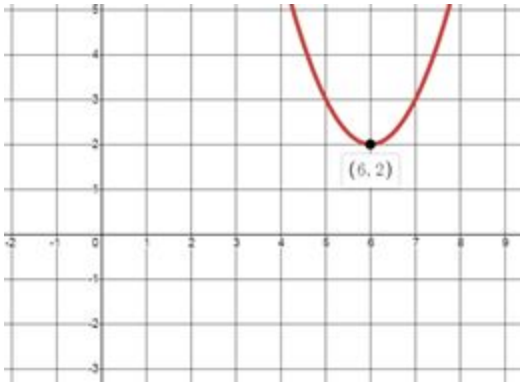
1) Identify whether the ***a*** and ***k*** values are positive or negative for the following graphs.

2) Create a function that best fits each graph shown.







3) Describe the transformations to the function f(x) to get g(x)= $\frac{1}{2}f(x-2)+3$

4) Describe the transformations to the function f(x) to get g(x)= $2f(x+5)-7$

5) Describe the transformations to the function f(x) to get g(x)= $-3f(x-6)-4$

6) What happens to the function f(x)= $a(x-h)^2+k$, if the value of ***a*** is changed from 2 to $-\frac{1}{4}$?

7) What do the ***a, h,*** and ***k*** values do to the function f(x)= $a(x-h)^2+k$?

Topic 4: Introduction to Polynomial Functions

Directions: Simplify the following by performing the indicated math operation.

1) $(2x-3)(x+5)$

2) $(2x^2+5x-3)+(3x^2-2x+5)$

3) $(5x^3+3x^2-3x)-(4x^2-6x)$

4) $5x^2(x^2+6x-2)$

5) $(6x^3-4x^2+5x)+(2x^3+3x^2-7x)$

6) $(3x^3-2x^2+6)-(5x^3+5x^2+7x)$

7) $(x-3)(2x^2+4x-5)$

8) $(4x^4-3x^2+5)+(2x^3-6x^2)$

9) $(4x^2+2x)-(-5x^2+6x-3)$

10) $(2x+1)(x^2-3x+2)$

11) $(8x^2+3)+(5x^3-6x^2+2)$

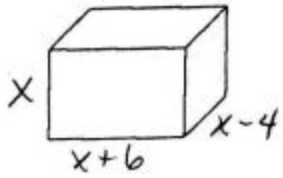
12) $(2x^3-5x+2)-(x^3+6x+4)$

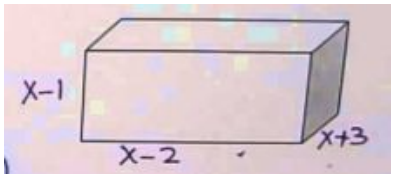
13) $3x(2x+4)(x-5)$

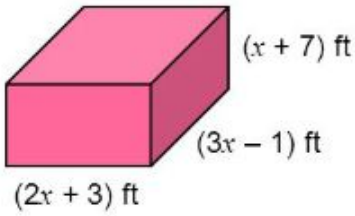
14) $(6x^3-2x+6)+(3x^2-6x+4)$

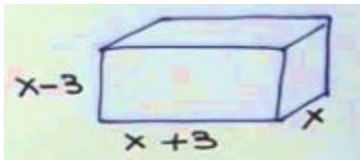
15) $(4x^4-2x-6)-(3x^3-4x^2-3x+2)$

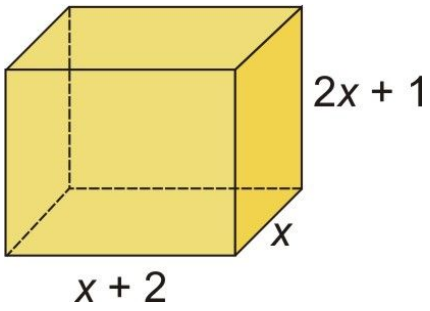
Directions: Find the volume of the following.. $V = l \cdot w \cdot h$

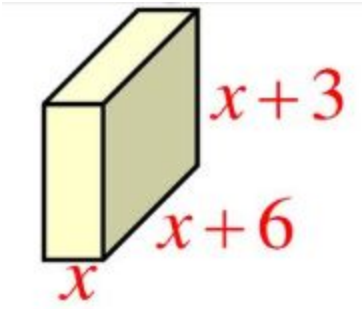
16) 

17) 

18) 

19) 

20) 

21) 

Directions: Identify the leading coefficient, degree and constant.

22) $3x^4+2x^2-5$

23) $2x-4x^2+8+3x^3$

24) $3x+5x^2-2+4x-7x^2$

25) $6x-3x^3+4x^5-2x^3$

26) $4x-8+3x^3-2x$

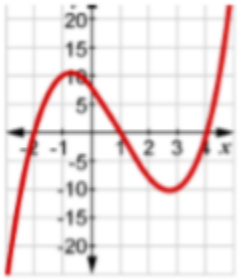
27) $6x^3+4x^2-8x+2$

Topic 5: Analyzing Polynomial Functions

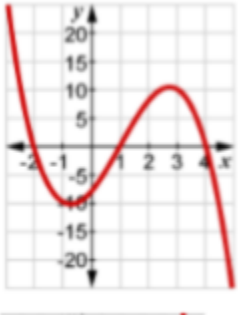
Directions: For each of the following, answer the following

a) Positive or Negative Leading Coefficient
b) Degree
c) End Behavior
d) Local and/or Global Maximums or Minimums **(on graphs only)**
e) Constant

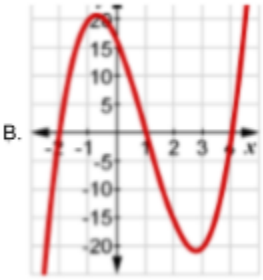
A.



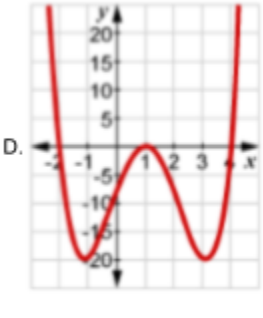
B.



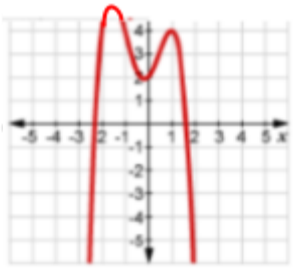
B.



D.



E.



F) $3x^4 - 4x + 6$

G) $-6x^5 + 4x^3 + 4x^2$

H) $4x^3 - 5x^2 + 6x - 2$

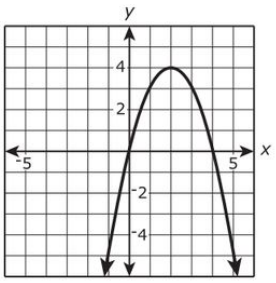
I) $5x - 2x^2 + 7$

J) $3x^2 + 2x^5 - 3x^3$

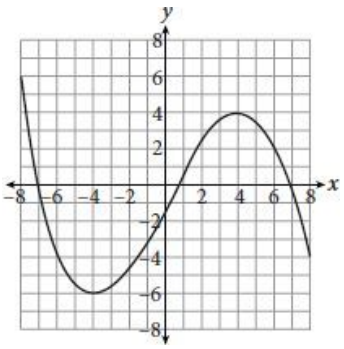
K) $3 - 5x^6 - 4x^2 + 5x$

Directions: For the following graphs, identify the increasing/ decreasing intervals.

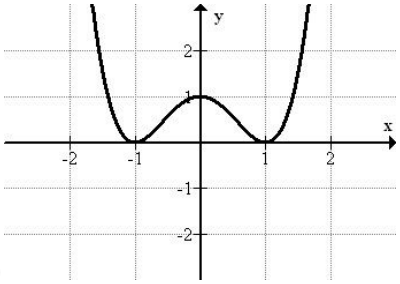
L)



M)



N)



Topic 6: Polynomial Equations

Directions: Solve the following equations.

1) $(x+10)(x-7)=0$

2) $x(x+9)(x+6)(x+1)=0$

3) $x(7x+3)(5x-2)=0$

4) $(x+3)(x-2)=0$

5) $x(x+4)(x-1)(x-2)(x+5)=0$

6) $(5x-15)(2x+3)=0$

Directions: Simplify each radical.

7) $\sqrt{-4}$

8) $\sqrt{-72}$

9) $\sqrt{-48}$

10) $\sqrt{-50}$

11) $\sqrt{-36}$

Directions: Use the *quadratic formula* to solve each of the following.

12) $2x^2-2x-4=0$

13) $x^2-4x-4=0$

14) $-2x^2-2x-1=0$

15) $4x^2-5x+1=0$

16) $6x^2-8x-2=0$

17) $9x^2-9x+5=0$

Directions: Simplify each expression.

18) $(-7+7i)+(-3+4i)$

19) $(-8+6i)-(6+i)$

20) $(7-5i)(-4+6i)$

21) $(2+2i)(-4-3i)$

22) $(-2-i)+(2-4i)$

23) $(8-6i)-(1-2i)$

24) $(-5-2i)-(-7-2i)$

25) $(-8-i)(-8-2i)$

26) $(-7+5i)+(6+3i)$

Topic 9 Review

1. Factor $n^2 - 16n - 80$

2. Factor $4n^2 + 16n - 9$

3. Simplify and state the asymptotes of $\frac{n^2-2n-8}{8n+24} \div \frac{2n-8}{n^2+7n+12}$

4. Simplify and state the asymptotes of $\frac{(n+13)(2n+9)}{(13n-2)(n+2)} \bullet \frac{(n+2)(2n-6)}{(n+13)(2n-6)}$

5. What are the asymptotes of $\frac{2n^2-9n-5}{3n^2-2n-33}$?

6. Simplify and state the asymptotes of $\frac{4x^2+8x-5}{(2x-1)(x-5)(x-1)}$

7. Simplify and state the asymptotes of $\frac{x}{x+2} - \frac{3x-5}{x^2+3x+2}$

8. Write your own rational expression with an asymptote at $x = \frac{-3}{7}$.

Topic 11

$\sqrt{2x+8} = -12$

$\sqrt{2x-1} + 2 = -1$

$\sqrt{3x} + 8 = 2$

$\sqrt{3x+1} = x - 1$

$\sqrt{2x-6} + 4 = x$

$\sqrt{x-1} + 4 = x - 3$

$2\sqrt{2x-1} = -6$

$3\sqrt{5-4x} = 3x$