Honors Algebra 2 Name KEY
Semester 2 Exam Review Date ______ Per ______

Chapter 6

Solve the system for a, b, and c.

I $a+3b+4c=6$
II $a-2b+c=10$
III $2a+3b-c=0$

II $a-2b+c=10$
III $2a+3b-c=0$
IV $\boxed{3a+b=10}$

I $a+3b+4c=6$
4·III $8a+12b-4c=0$
V $\boxed{9a+15b=6}$

−3·IV $-9a-3b=-30$
V $9a+15b=6$

$\frac{12b}{12}=\frac{-24}{12}$

$\boxed{b=-2}$

SOLUTION: $(4,-2,2)$

TO FIND "c" → III $2(4)+3(-2)-c=0$
$8-6-c=0$
$\boxed{2=c}$

IV $3a+(-2)=10$
$3a=12$
$\boxed{a=4}$ ← TO FIND "a"

What is the equation of the parabola that passes through the points (-4, 3), (-2,-9), and (1, 3)? STANDARD FORM OF A QUADRATIC FUNCTION: $y=ax^2+bx+c$

I $a(-4)^2+b(-4)+c=3 \longrightarrow 16a-4b+c=3$
II $a(-2)^2+b(-2)+c=-9 \longrightarrow 4a-2b+c=-9$
III $a(1)^2+b(1)+c=3 \longrightarrow a+b+c=3$

Equation: $y=2x^2+6x-5$

I $16a-4b+c=3$
−1·II $-4a+2b-c=9$
IV $\boxed{12a-2b=12}$

I $16a-4b+c=3$
−1·III $-a-b-c=-3$
V $\boxed{15a-5b=0}$

$\frac{1}{2}$·IV $6a-b=6$
$-\frac{1}{5}$·V $-3a+b=0$
$3a=6$, so $\boxed{a=2}$

$-3(2)+b=0$, $\boxed{b=6}$

$2+b+6=3$
$b+8=3$
$\boxed{b=-5}$

Simplify the algebraic expressions below. Assume denominators do not equal zero.

$\frac{15-5x}{x^2-x-6}\div\frac{5x}{x^2+6x+8}$ $\frac{-5\cancel{(x-3)}}{\cancel{(x-3)}\cancel{(x+2)}}\cdot\frac{(x+4)\cancel{(x+2)}}{\cancel{5}x}$ $\frac{-(x+4)}{x}$	$\frac{x^2-16}{(x-4)^2}\cdot\frac{x^2-3x-18}{x^2-2x-24}$ $\frac{\cancel{(x+4)}\cancel{(x-4)}}{(x-4)\cancel{(x-4)}}\cdot\frac{\cancel{(x-6)}(x+3)}{\cancel{(x-6)}\cancel{(x+4)}}$ $\frac{x+3}{x-4}$
$\frac{x^2-y^2}{x+y}\cdot\frac{1}{x-y}$ $\frac{\cancel{(x+y)}\cancel{(x-y)}}{\cancel{(x+y)}}\cdot\frac{1}{\cancel{(x-y)}}=1$	$\frac{x^2+7x+10}{x+2}\div\frac{x^2+2x-15}{x+2}$ $\frac{\cancel{(x+5)}\cancel{(x+2)}}{\cancel{(x+2)}}\cdot\frac{(x+2)}{\cancel{(x+5)}(x-3)}=\frac{x+2}{x-3}$

Simplify the algebraic expressions below. Assume denominators do not equal zero.	
$\frac{2}{x+4}-\frac{x-4}{x^2-16}$ $\frac{2}{x+4}-\frac{\cancel{(x-4)}}{(x+4)\cancel{(x-4)}}$ $\frac{2}{x+4}-\frac{1}{x+4}=\frac{1}{x+4}$	$\frac{(n+1)}{(n+1)}\cdot\frac{2}{n+8}+\frac{4}{n+1}\cdot\frac{(n+8)}{(n+8)}$ $\frac{2(n+1)}{(n+1)(n+8)}+\frac{4(n+8)}{(n+1)(n+8)}=$ $=\frac{2n+2+4n+32}{(n+1)(n+8)}=\frac{6n+34}{(n+1)(n+8)}$
$\frac{x}{x-1}-\frac{1}{x+1}$ $\frac{(x+1)x}{(x+1)(x-1)}-\frac{1(x-1)}{(x+1)(x-1)}$ $\frac{x^2+x-x+1}{(x+1)(x-1)}=\frac{x^2+1}{(x+1)(x-1)}$	$\frac{5}{5}\cdot\frac{2x+5}{4x^2}+\frac{2x-5}{10x}\cdot\frac{2x}{2x}$ $\frac{5(2x+5)}{20x^2}+\frac{(2x-5)(2x)}{20x^2}$ $\frac{10x+25+4x^2-10x}{20x^2}=\frac{4x^2+25}{20x^2}$

Solve each equation. Round answers to nearest 4 decimal places (if necessary).	
$\frac{18(1.2)^{(2x-1)}}{18}=\frac{900}{18}$ $(1.2)^{2x-1}=50$ $\log(1.2)^{2x-1}=\log 50$ $(2x-1)\cdot\log(1.2)=\log 50$ $2x-1=\frac{\log 50}{\log 1.2}$ $x=\frac{1}{2}\left(\frac{\log 50}{\log 1.2}+1\right)$ $x\approx 11.2284$	$\log_a x=2\log_a 3+\log_a 5$ $\log_a x=\log_a 3^2+\log_a 5$ $\log_a x=\log_a(9\cdot 5)$ $\log_a x=\log_a(45)$ $x=45$
$4+3x^4=81$ $-4\quad -4$ $\frac{3x^4}{3}=\frac{77}{3}$ $x^4=\frac{77}{3}$ $\sqrt[4]{x^4}=\sqrt[4]{\frac{77}{3}}$ $x\approx 2.2508$	$\log_5(3y)+\log_5(9)=\log_5(405)$ $\log_5(27y)=\log_5(405)$ $27y=405$ $y=15$
$\log(x)+\log(x+21)=2$ $\log[x(x+21)]=2$ $\log_{10}(x^2+21x)=2$ $10^2=x^2+21x$ $0=x^2+21x-100$ $0=(x+25)(x-4)$ EXTRANEOUS $\rightarrow$ $x\neq -25$, $x=4$	$\log(3x+5)-\log(x-5)=\log(8)$ $\log\left(\frac{3x+5}{x-5}\right)=\log(8)$ $\frac{3x+5}{x-5}=8$ $8x-40=3x+5$ $5x=45$ $x=9$

Be sure that you know the following Properties of Logarithms (p289):

Definition of logs – $\log_m(a)=n$ means $m^n=a$

Product Property – $\log_m(a\cdot b)=\log_m(a)+\log_m(b)$

Quotient Property – $\log_m\left(\frac{a}{b}\right)=\log_m(a)-\log_m(b)$

Power Property – $\log_m(a^n)=n\cdot\log_m(a)$

Inverse Relationship – $\log_m(m)^n=n$ <u>and</u> $m^{\log_m(n)}=n$

The population of wild cats in central Ohio has been declining in recent years. In the year 2000, there were 1800 wild cats running the streets. Two years later the population was estimated to be at 1698. The population is expected to level off at 1600 wild cats.

What kind of function would best model the population over time? exponential

$y = ab^x + C$

Write an equation that would model the changing wild cat population over time.

$y = 200(0.7)^x + 1600$ $a = 200$ $b = \frac{7}{10}$ or 0.7

The following is a list of the checkpoints that were covered in Chapter 6. There are practice problems in this review, but if you feel like you need additional practice with any of these skills it is available in the textbook.

$(0, 1800)$ $(2, 1698)$

$1800 = ab^0 + 1600$

$1698 = ab^2 + 1600$

$\frac{98}{200} = \frac{ab^2}{ab^0}$ $b^2 = \frac{49}{100}$

$b = \frac{7}{10}$

$98 = a\left(\frac{7}{10}\right)^2$

$200 = a$

Chapters 6 Checkpoints:

Chapter 6 – Checkpoint A (p807)
Multiplying and Dividing Rational Expressions

Chapter 6 – Checkpoint B (p809)
Adding and Subtracting Rational Expressions