Name______________

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Advanced Algebra

Review #6 for the Final Exam 2018

Zeros of a Function:

Key Point:

The zero of a function is any replacement for the variable that will produce an answer of zero. Graphically, the real zero of a function is where the graph of the function crosses the x axis.

Example: Find the zeros of the function $f(x) = x^2-8x-9$

$(x-9)(x+1)$ ⇐ We first want to factor the given function.

By the zero product property we have $(x-9)=0$ and $(x+1)=0$ ⇐ We factor to find the roots

This gives us two zeros or roots of 9 and -1

Therefore $f(9) = 0$ and $f(-1) = 0$ ⇐ This is a key point of "Zeros" or roots of a function

Factoring Higher level polynomials with "quadratic techniques"

Factor and analyze $f(x) = x^4-10x^2+9$

$(x^2-9)\ (x^2-1)$ this can be factored further to $(x-3)(x+3)\ (x-1)(x+1)$

Therefore the zeros of the function are 3,-3,1,-1

So, $f(3)=0$ $f(-3)=0$ $f(1)=0$ $f(-1) = 0$ ⇐ Again, this is a key concept of "Zeros"

You practice: Find the zeros of the following functions, then say what f(the zero) is like above.

$f(x) = (x^2-25)\ (x-7)$	$f(x) = (x^4-16)(x+3)$	$f(x) = x^2-13x+36$
$f(x)=2x^2-11x+12$	$f(x) = 3x^2-14x-24$	$F(x) = (\ x^4-100)(x+16)$

Use division or your calculator to find the other roots of $f(x)=x^3-19x+30$ given 1 root is 2

What are the factors?

What are the zeros?

What are f(roots)

Use division or your calculator to find the other roots of $f(x)=x^3-5x^2-18x+72$ given 1 root is 6

What are the factors?

What are the zeros?

What are f(roots)

Extra Practice:

What are the zeros of the following functions:

$f(x) = x^3-18x^2+80x$	$f(x)=x^3-3x^2-10x+24$ and the fact 1 root is 2	$f(x)= x^3 - 2x^2 -33x+90$ And the fact 1 roots is -6	$f(x)= x^3-14x^2+28x+120$ and the fact that 1 root is 6

I can work with rational graphs:

Key concept:

- You can find the vertical asymptote by setting the denominator of the fraction equal to Zero
- You can find the x intercepts of the function by setting the numerator equal to zero
- You then put this "key information" on your graph and you can use your calculator to test some points to figure which way to draw the graph.

Figure the key information and sketch a graph of the following rational functions:

$f(x) = \frac{4(x-3)(x+6)}{(x+4)}$

$f(x)= \frac{1}{(x-2)} +4$

Multiple Choice practice:

Which values are the zeros of the polynomial function …f(x)= x^3 -10x^2-8x+192

A.	B.	C.	D.
$-8,-4,6$	$-8,4,6$	$8,-4,6$	$-8,4,-6$

E. None of the above

A system of linear inequalities and two possible solution sets are shown below:

$$\begin{cases} 4x - y \leq 12 \\ 2x + y \geq 8 \end{cases}$$

A=$\{(1,1),(0,-3)\ (0,2)\}$

B=$\{(-1,8),(-3,20),(0,5)\}$

Which statement is true regarding the solutions to this system?

A.	B.	C.	D.
Only set A is a solution set	Only set B is a solution set	Both sets A and B are a solution sets	Neither Set A nor set B are solution sets

E. None of the above

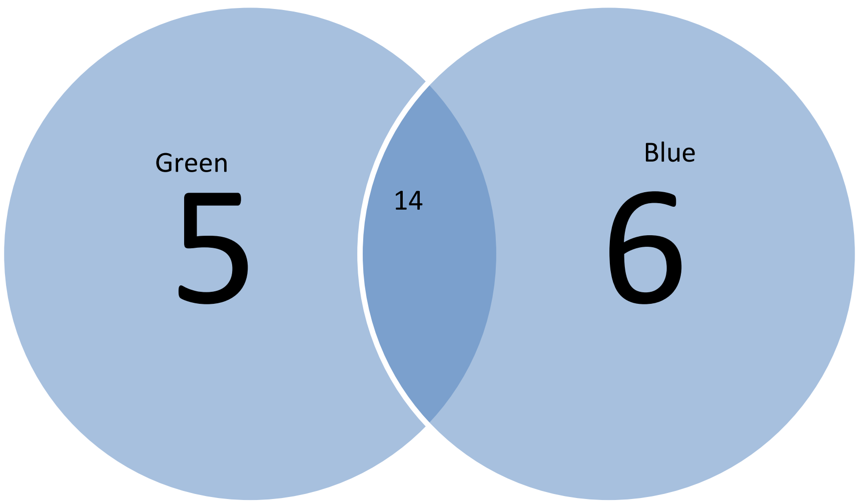
Graph and find the feasible region for the following:

$$\begin{cases} y \geq 3 \\ y \leq -.5x + 6 \\ x \leq 4 \end{cases}$$

Key Point: The definition of Independence is given by P(A)*P(B) = P(A∩B)

Sally administers a survey to see if having green eyes is independent of wearing a blue shirt. There are 30 students in the class.

Is having green eyes independent of wearing a blue shirt? Give proof with number s AND with the probability notation.



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Chapter 10- Trigonometry

Draw the following angles in standard position and find the reference angle

1) 230°
2) 155°
3) $\frac{3\pi}{4}$
4) $\frac{7\pi}{4}$

Use reference angles to show if the following are equal

5) Cos 30 and cos 150
6) Cos 30 and cos (-30)
7) Tan (70) and tan (110)
8) Sin (60) and sin (120)

Find the complement of the given angle

9) 30°
10) $\frac{\pi}{3}$

Find the supplement of the given angle

11) $150°$
12) $\frac{3\pi}{4}$

Find a positive and a negative angle that are co-terminal with the given angle

13) $50°$
14) $\frac{7\pi}{6}$

Convert between radians and degrees

15) $\frac{5\pi}{4}$
16) $30°$
17) $\frac{17\pi}{15}$

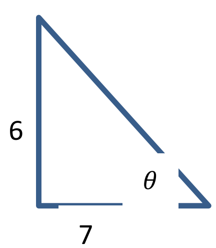
Find the arc length for each central angle

18) r= 1.5 $\vartheta = \frac{\pi}{12}$
19) r=5 $\vartheta = 150°$

Draw a picture and solve for θ

20) $\sin\vartheta = -1$ and $0° \leq \theta \leq 360$
21) $\cos\theta = \frac{-\sqrt{3}}{2}$ and $\pi \leq \theta \leq 2\pi$

Evaluate the 6 trig functions from the given triangle



Find Sinθ and Cosθ for each angle in standard position

The terminal side of the angle θ passes through the point (5,12)

22) What is the $\sin^2\theta + \cos^2\theta$ =

Trig Equations:

Foundational: $2\sin\theta - 1 = 0$

Moderate: $2\cos(3\theta) - \sqrt{3} = 0$

Higher challenge: $\sin^2\theta + 3\sin\theta + 2 = 0$

Extra Practice on working with rational Graphs. You should be able to easily identify the following:

- You can find the vertical asymptote by setting the denominator of the fraction equal to Zero
- You can find the x intercepts of the function by setting the numerator equal to zero
- You then put this "key information" on your graph and you can use your calculator to test some points to figure which way to draw the graph.

Unit 2: Functions

Rational Functions- Graphs and Domain

Find the x and y intercepts and the Horizontal and Vertical asymptotes.

Make a sketch of each rational graph using the information that you find. State the Domain and the range of each.

1) $f(x) = \frac{x-2}{x+2}$

Horizontal_________________

Vertical__________________

X-intercept_____________

Y intercept_______________

2) $f(x) = \frac{2(x^2-9)}{x^2-4}$

horizontal_______________

vertical_________________

x-intercept______________

y intercept________________

3) f(x) = $\frac{2x-6}{x+4}$

Horizontal_________________

Vertical__________________

X-intercept________________

Y-intercept_______________

4) f(x) = $\frac{-5}{x+9}$

Horizontal________________

Vertical__________________

x- intercept_______________

Y- intercept________________

5) f(x)= $\frac{3}{4x+10}$

Horizontal__________________

Vertical____________________

X-intercept_________________

Y intercept_________________

6) f(x) = $\frac{5x+1}{x^2-1}$

Horizontal________________

Vertical__________________

X-intercept________________

y-intercept________________

7) f(x)= $\frac{x^2-10x+24}{3x}$

Horizontal________________

Vertical__________________

X-intercept________________

Y-intercept_______________

8) f(x)= $\frac{-2x^2}{x^2-9}$

Horizontal_______________

Vertical_________________

X-intercept______________

Y-intercept_______________