Name Key Date _____ Hour _____

$\frac{4}{(x+7)(x-2)}$

Algebra II – Unit 4 Review

1) Using your graphing calculator, graph the function $f(x) = \frac{4}{x^2+5x-14}$. Identify all vertical and horizontal asymptotes. State the domain and describe how the vertical asymptotes relate to the domain.

V. Asym: $x = -7$ $x = 2$

H. Asym $y = 0$

Domain? All real #s except -7 & 2

The V. Asym. relate to the domain because those values are what is excluded from your domain.

2) Create an example of each of the following and explain how you know the domain.

a) A rational function with domain of all real numbers except -3 & 6.

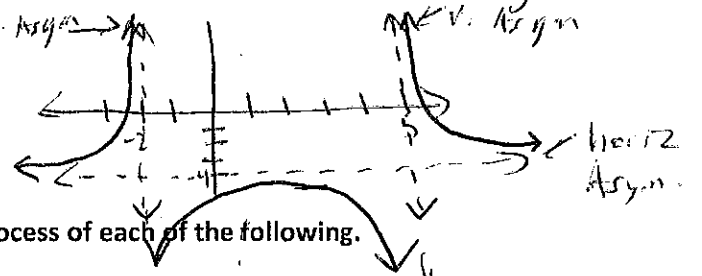
$y = \frac{5}{(x+3)(x-6)}$ Domain is all real #s except the vertical asymptotes which are -3 & 6

b) A rational function with a domain of all real numbers.

$y = \frac{5}{x^2+1}$ There are no vertical asymptotes because there is no value you can plug in for x to make the rational expression UND.

3. The domain of a rational function is $(-\infty,-2)U(-2,5)U(5,\infty)$. The graph of the function has a horizontal asymptote at y=-4. Draw a possible graph that corresponds to this information.

$(-\infty,-2)U(-2,5)U(5,\infty)$ means Domain is all real #s except -2 & 5 which are the vertical asym.



4. Explain the process of each of the following.

a) Adding Rational Expressions

① Make common denominators
② Add the numerators, keep the denominators
③ Simplify

b) Subtracting Rational Expressions

① Make common denominators
② Subtract the numerators
* Remember to change the signs of the second fraction.
③ Simplify

c) Multiplying Rational Expressions

① Factor all parts
② Cancel anything alike on top & bottom
③ Multiply across the top
④ Multiply across the bottom.

d) Dividing Rational Expressions

① Factor all parts
② Flip the second fraction & change to multiplication
③ Cancel anything alike on top & bottom
④ multiply across the top
⑤ multiply across the bottom

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5. What values of x would result in extraneous values for the equation $\frac{2}{x+3} - \frac{3}{x} = \frac{-5}{x+2}$. Explain why those values are extraneous.

Extraneous Values
$X = -3, 0, -2$

These are the Values that make the equation UND

6. Solve the following. Identify any extraneous solutions.

a) $\frac{2}{5} = \frac{5}{x+1}$

Extraneous
$X = -1$

$25 = 2(x+1)$
$25 = 2x + 2$
$-2 \quad -2$
$\frac{23}{2} = \frac{2x}{2}$
$X = 11.5$

b) $\frac{x+2}{3} = \frac{x-1}{4}$

No extraneous

$3(x-1) = 4(x+2)$
$3x - 3 = 4x + 8$
$-3x \quad -3x$
$-3 = x + 8$
$-8 \quad -8$
$-11 = x$

$X = -11$

7. Bob's dentist determined the number of cavities developed in his patient's mouth each year is inversely proportional to the total number of minutes spent brushing during each session. If Bob developed 4 cavities during the year he spent only 30 seconds brushing his teeth each time, how many annual cavities will Bob develop if he increases his brushing time to 2 minutes per session?

$Y = \frac{K}{X}$

$C = \frac{K}{m}$ $\quad 0.5 * 4 = \frac{K}{0.5} * 0.5$

$K = 2$

$C = \frac{2}{m}$

$C = \frac{2}{2}$

$C = 1$

1 cavity

8. Create your own real life example of the following. Support your example with numerical data.

a) A direct variation example

b) An inverse variation example

Create your own, make sure you have one on your notecard!