Adv. Algebra 2 – Concept Quiz

Form A

Name: Key

Date: ____________ Period: ________

21. Graphs of Rational Functions

a) Find the characteristics listed below of the function $f(x) = \frac{x+3}{x^2+4x-12}$.

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

a. Vertical Asymptote $x = -6, 2$

b. End Behavior as x gets larger and larger, f(x) approaches y = 0.

$f(x) = 0 + \frac{x+3}{x^2+4x-12}$

c. x-intercept(s) $(-3, 0)$

d. y-intercept $(0, -1/4)$

b) As x gets larger and larger in the positive and negative direction, the graph of $g(x) = \frac{x^2-3x-5}{x+2}$ approaches the line $y = x - 5$. Explain why this is end behavior of $g(x)$.

$$\begin{array}{r|rrr} -2 & 1 & -3 & -5 \\ & & -2 & 10 \\ \hline & 1 & -5 & 5 \end{array}$$

$g(x) = x - 5 + \frac{5}{x+2}$

As x gets larger + larger in the positive + negative direction, the term $\frac{5}{x+2}$ starts to approach zero. Thus, g(x) approaches the line $y = x - 5$.

22. Solving Rational Equations

a) Find all values of x that make the equation true.

$$x \cdot (x-4) \frac{3}{x-4} = \frac{x-5}{x} \cdot (x-4) \cdot x$$

$$3x = (x-5)(x-4)$$

$$3x = x^2 - 9x + 20$$

$$0 = x^2 - 12x + 20$$

$$0 = (x-10)(x-2)$$

$$\boxed{x = 10, 2}$$

b) How can extraneous solutions arise in the process of solving an equation?

Extraneous solutions arise when solving an equation when the solutions make the original equation undefined. This happens with rational equations when the solution makes the denominator zero.

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Form B

21. Graphs of Rational Functions

a) Find the characteristics listed below of the function $f(x) = \frac{x-5}{x^2+3x-18}$. $\frac{x-5}{(x+6)(x-3)}$

a. Vertical Asymptote $x = -6, 3$

b. End Behavior as x gets larger & larger, f(x) approaches y=0.

$f(x) = 0 + \frac{x-5}{x^2+3x-18}$

c. x-intercept(s) $(5,0)$

d. y-intercept $(0, 5/18)$

b) As x gets larger and larger in the positive and negative direction, the graph of $g(x) = \frac{x^2-5x+2}{x-3}$ approaches the line $y = x - 2$. Explain why this is end behavior of $g(x)$.

$$\begin{array}{r|rrr} 3 & 1 & -5 & 2 \\ & & 3 & -6 \\ \hline & 1 & -2 & \boxed{-4} \end{array}$$

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

As x gets larger & larger in the positive & negative direction, the $\frac{-4}{x-3}$ starts to approach 0. Thus, g(x) approaches the line $y = 1x - 2$.

22. Solving Rational Equations

1. Find all values of x that make the equation true.

$$x \cdot (x-6)\,\frac{x+2}{x} = \frac{-3}{x-6} \cdot x(x-6)$$

$(x-6)(x+2) = -3 \cdot x$

$x^2 - 4x - 12 = -3x$

$x^2 - x - 12 = 0$

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

$\boxed{x = 4, -3}$

2. How can extra solutions arise in the process of solving an equation?