Algebra II Name KEY

Section 9-5 Equations & Inequalities

Name the excluded (or restricted) value(s) for each equation or inequality. When in doubt...

1) $\frac{c}{c-7}=\frac{2}{c+10}$

$c \neq 7, -10$

2) $\frac{1}{x}-10 \geq \frac{5}{3x+4}$

$x \neq 0, -4/3$

3) $\frac{y+2}{y-2}<\frac{y-6}{y+11}$

$y \neq 2, -11$

4) $\frac{8}{n^2-64}=\frac{2}{3}+\frac{3}{3n^2+19n-14}$

$(n+8)(n-8) \quad (3n-2)(n+7)$

$n \neq \pm 8, 2/3, -7$

5) $\frac{r}{r^2-r}-\frac{9}{r^2+7r-8} \leq \frac{2r}{5r+10}$

$r(r-1) \quad (r+8)(r-1) \quad 5(r+2)$

$r \neq 0, 1, -8, -2$

Solve each equation by first finding common denominators.

6) $\frac{5}{6}=\frac{x+7}{2x+2}$

$10x+10=6x+42$

$4x+10=42$

$4x=32$

$x=8$

7) $\frac{4}{x}=\frac{x+3}{x+5}$

$4x+20=x^2+3x$

$0=x^2-x-20$

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

$x=5, x=-4$

8) $\frac{2}{x}-\frac{3}{1}\cdot\frac{(x)}{(x)}=\frac{11}{x}$

$2-3x=11$

$-3x=9$

$x=-3$

9) $\frac{6}{z-5}-4=\frac{-6}{5-z}\cdot\frac{(-1)}{(-1)}$

$\frac{6}{z-5}-\frac{4(z-5)}{1(z-5)}=\frac{6}{z-5}$

$6-4(z-5)=6$

$6-4z+20=6$

$-4z+26=6$

$-4z=-20$

$z=5$

(restriction)

$\emptyset$

10) $\frac{(2)}{(2)}\frac{4}{3m}+\frac{m}{2}\cdot\frac{(3m)}{(3m)}=\frac{2}{m}\cdot\frac{(6)}{(6)}$

$8+3m^2=12$

$3m^2=4$

$m^2=\frac{4}{3}$

$m=\pm\sqrt{\frac{4}{3}}$

$m=\frac{\pm 2\sqrt{3}}{3}$

or ± 1.2

11) $\frac{(x-1)}{(x-1)}\frac{1}{x}=\frac{3}{x^2-x}-\frac{2}{x-1}\cdot\frac{(x)}{(x)}$

$x(x-1)$

$x-1=3-2x$

$3x-1=3$

$3x=4$

$x=\frac{4}{3}$

12) $\frac{(y+5)(-1)}{(y+5)(-1)}\frac{y}{5-y}+\frac{y-1}{y^2-25}=\frac{-2}{y-5}\frac{(y+5)}{(y+5)}$

$(y+5)(y-5)$

$-1y(y+5)+y-1=-2(y+5)$

$-y^2-5y+y-1=-2y-10$

$0=y^2+2y-9$

use quadratic formula

$y=2.2,\ y=-4.2$

13) $\frac{3(w-4)}{2w+8}-\frac{3^{(6)}}{w^2-16}=\frac{1\ (2)(w+4)}{3w-12}$

$2(w+4)\quad (w+4)(w-4)\quad 3(w-4)$

$3(w-4)\quad (6)\quad 2(w+4)$

$3(5)(w-4)-3(6)=2(w+4)$

$15w-60-18=2w+8$

$13w-78=8$

$13w=86$

$w=86/13$

Solve each rational inequality, then use the solution and excluded values to create a number line. Use the number line to test values, then write a solution set based on the results.

14) $\frac{3}{a+1}\geq\frac{3}{1}$ $a\neq -1$

$3=3a+3$

$0=3a$

$0=a$

F T F

-1 0 TEST(1)

$\{-1<a\leq 0\}$

15) $\frac{1}{x}\geq\frac{4x}{1}$ $x\neq 0$

$1=4x^2$

$0=4x^2-1$

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

$x=1/2,\ x=-1/2$

T F T F

$-1/2$ 0 $1/2$ TEST(1)

$\{x\leq -\frac{1}{2}$ or $0<x\leq\frac{1}{2}\}$

16) $\frac{(15)1}{(15)2p}+\frac{(6)4}{5p(6)}>\frac{2}{3}\frac{(10p)}{(10p)}$ $p\neq 0$

$15+24=20p$

$39=20p$

$39/20=p$

F T F

0 TEST(1) $39/20$

$\{0<p<\frac{39}{20}\}$

17) $\frac{(2)3}{(2)2x}-\frac{(4)2}{x(4)}>\frac{1(x)}{4(x)}$ $x\neq 0$

$6-8=x$

$-2=x$

F T F

-2 0 TEST(1)

$\{-2<x<0\}$

18) $\frac{(x)4}{(x)x-1}+\frac{5^{(x-1)}}{x(x-1)}<\frac{2}{1}\frac{(x)(x-1)}{(x)(x-1)}$

$x\neq 0,1$

$4x+5x-5=2x^2-2x$

$9x-5=2x^2-2x$

$0=2x^2-11x+5$

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

$x=1/2,\ x=5$

T F T F T

0 $1/2$ 1 5

$\{x<0$ or $\frac{1}{2}<x<1$ or $x>5\}$

19) $\frac{3}{x^2-1}+\frac{1}{1}>\frac{2}{x-1}\frac{(x+1)}{(x+1)}$

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

$x\neq\pm 1$

$3+x^2-1=2x+2$

$x^2+2=2x+2$

$x^2-2x=0$

$x(x-2)=0$

$x=0,\ x=2$

T F T F T

-1 0 1 2

$\{x<-1$ or $0<x<1$ or $x>2\}$