

For what values of the variable is the rational expression undefined?

1.  $\frac{3}{4x}$   $4x \neq 0$   
 $x \neq 0$

2.  $\frac{2x}{7}$  n/a

3.  $\frac{5}{x+2}$   $x \neq -2$

4.  $\frac{x+2}{x-5}$   $x-5 \neq 0$   $x \neq 5$

5.  $\frac{14}{2x+8}$   $2x+8 \neq 0$   
 $x \neq -4$

6.  $\frac{x+5}{(x-2)(x+1)}$   $x \neq 2$   $x \neq -1$

7.  $\frac{2x+9}{(x-5)(x+9)}$   
 $x \neq 5$   $x \neq -9$

8.  $\frac{5}{x^2-1}$   
 $(x+1)(x-1)$   $x \neq -1$   $x \neq 1$

9.  $\frac{x+4}{x^2+x-6}$   $x \neq -3$   $x \neq 2$   
 $(x+3)(x-2)$

Determine whether the rational expression has been simplified correctly.

10.  $\frac{3x+7}{7} \stackrel{?}{=} 3x$  No!

11.  $\frac{2x}{2x+10} \stackrel{?}{=} \frac{x}{x+5}$  Yes!

12.  $\frac{5+x}{5+2x} \stackrel{?}{=} \frac{1}{2}$  No!

13.  $\frac{x^2+7}{x+7} \stackrel{?}{=} x$  No!

14.  $\frac{6x}{2x^2+x} \stackrel{?}{=} \frac{6}{2x+1}$  Yes!

15.  $\frac{1+x}{1+x^2} \stackrel{?}{=} \frac{1}{x}$  No!

Simplify the expression if possible.

16.  $\frac{4x}{12} = \frac{x}{3}$

17.  $\frac{18x}{36} = \frac{x}{2}$

18.  $\frac{15x^2}{10x} = \frac{3x}{2}$

19.  $\frac{18x^2}{10 \cdot 60x^3} = \frac{3}{10x}$

20.  $\frac{3x}{10x+x^2} = \frac{3}{10+x}$   
 $x(10+x)$

21.  $\frac{x(2x+1)}{2x^2+x} = x$   
 $2x^2+x$

22.  $\frac{x^2-16}{3x+12} = \frac{x-4}{3}$   
 $(x+4)(x-4)$   
 $3(x+4)$

23.  $\frac{x^2-25}{x-5} = \frac{(x+5)(x-5)}{(x-5)} = x+5$

24.  $\frac{9-x^2}{x^2-5x+6} = \frac{1}{x-2}$   
 $x-3$   
 $(x-2)(x-3)$

25.  $\frac{9-x^2}{x+3} = \frac{(3-x)(3+x)}{x+3} = 3-x$

26.  $\frac{8-6x+x^2}{16-x^2} = \frac{(x-4)(x-2)}{(4+x)(4-x)}$

27.  $\frac{(3-x)(5-x)}{(x-3)(x-5)} = -1$

For what values of the variable is the rational expression undefined?

1.  $\frac{7}{14x}$   $x \neq 0$

2.  $\frac{-5x}{10}$  n/a  
 $\frac{(x-4)(x-2)}{(4+x)-1(x-4)}$

3.  $\frac{8}{x+4}$   $x \neq -4$

4.  $\frac{x+3}{x-6}$   $x \neq 6$

5.  $\frac{20}{5x+10}$   $x \neq -2$

6.  $\frac{5x+2}{(x-6)(x+9)}$   $x \neq 6, -9$

7.  $\frac{x-3}{x^2+5x-6}$   $x \neq -6, 1$   
 $(x+6)(x-1)$

8.  $\frac{x-7}{x^2-49}$   $x \neq -7$   
 $(x+7)(x-7)$

9.  $\frac{x^2-2x-3}{x^2-9}$   $x \neq -3$   
 $(x+3)(x-3)$

Simplify the expression if possible.

10.  $\frac{7x}{21} = \frac{x}{3}$

11.  $\frac{20x}{28} = \frac{5x}{7}$

12.  $\frac{18x^2}{12x} = \frac{3x}{2}$

13.  $\frac{36x^4}{42x^7} = \frac{6}{7x^3}$

14.  $\frac{5x}{x^2+3x} = \frac{5}{x+3}$

15.  $\frac{2x^2+x}{4x} = \frac{2x+1}{4}$

16.  $\frac{x^2-1}{6x+6} = \frac{(x-1)}{6}$

17.  $\frac{4x-12}{x^2-9} = \frac{4}{x+3}$

18.  $\frac{x^2-3x-10}{x^2+5x+6} = \frac{x-5}{x+3}$

19.  $\frac{2x^2+5x+3}{4x^2+4x-3} = \frac{x+1}{2x-1}$

20.  $\frac{x^2+10x+24}{x^2-16} = \frac{x+6}{x-4}$

21.  $\frac{x^3-x^2-12x}{x^3-9x} = \frac{x-4}{x-3}$