

Simplify Rational Expressions

Simplify. State any restrictions on the variable.

1. $\frac{p^2-4p-32}{p+4}$

$$p-8$$

2. $\frac{x^2+3x-28}{x^2-49}$

$$\frac{x-4}{x-7}$$

3. $\frac{2m^2+10m-48}{8m+64}$

$$\frac{m-3}{4}$$

Multiply/Divide Rational Expressions

Simplify. Remember to keep, change, flip when dividing.

4. $\frac{z^2}{z+1} \cdot \frac{z^2+3z+2}{z^2+3z}$

$$\frac{z(z+2)}{z+3}$$

5. $\frac{c+1}{c-5} \div \frac{c-2}{c^2-7c+10}$

$$c+1$$

6. $\frac{x^2-16}{x^2+5x+6} \div \frac{x^2+5x+4}{x^2-2x-8}$

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

7. $\frac{b^2}{b+9} \cdot \frac{b^2+15b+54}{b^2-4b}$

$$\frac{b(b+6)}{b-4}$$

Add/Subtract Rational Expressions

Simplify. Remember to get a common denominator first.

8. $\frac{3}{m+5} + \frac{8}{m^2-25}$

$$\frac{3m-7}{(m+5)(m-5)}$$

9. $\frac{k^2-2k-8}{k^2+k-2} - \frac{6}{k-1}$

$$\frac{k-10}{k-1}$$

10. $\frac{w^2+2w-24}{w^2+w-30} + \frac{8}{w-5}$

$$\frac{w^2+6w+24}{(w+6)(w-5)}$$

11. $\frac{3}{x+7} - \frac{4}{x-8}$

$$\frac{-x-52}{(x+7)(x-8)}$$

Solve Rational Equations

Solve. Remember to check for extraneous solutions.

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

$$x = -3.67$$

13. $\frac{v^2}{v-4} = \frac{16}{v-4}$

$$v = -4$$

14. $\frac{a}{a^2-36} + \frac{2}{a-6} = \frac{1}{a+6}$

$$a = -9$$

Graphs of Rational Functions

Identify holes, vertical asymptotes, horizontal asymptotes, and domain of the rational functions. Then graph the function.

15. $f(x) = \frac{3x^2+21x}{x^2+5x-14}$

16. $f(x) = \frac{4}{(x+3)(x-1)}$

17. $f(x) = \frac{x^2-9x+20}{4x^2-12x-40}$

Hole:	$x = -7$
VA:	$x = 2$
HA:	$y = 3$
Domain:	$x \neq -7, 2$

Hole:	none
VA:	$x = -3, x = 1$
HA:	$y = 0$
Domain:	$x \neq -3, 1$

Hole:	$x = 5$
VA:	$x = -2$
HA:	$y = \frac{1}{4}$
Domain:	$x \neq 5, -2$

