

Name: _____

Date: _____

Class: _____

SOLVING RATIONAL EQUATIONS WORKSHEET

Solve each equation and check (state excluded values).

1. $\frac{2a-3}{6} = \frac{2a}{3} + \frac{1}{2}$

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

2. $\frac{2b-3}{7} - \frac{b}{2} = \frac{b+3}{14}$

7. $\frac{5}{5-p} - \frac{p^2}{5-p} = -2$

3. $\frac{3}{5x} + \frac{7}{2x} = 1$

8. $\frac{2a-3}{a-3} - 2 = \frac{12}{a+3}$

4. $\frac{5k}{k+2} + \frac{2}{k} = 5$

9. $\frac{2b-5}{b-2} - 2 = \frac{3}{b+2}$

5. $\frac{m}{m+1} + \frac{5}{m-1} = 1$

10. $\frac{4}{k^2-8k+12} = \frac{k}{k-2} + \frac{1}{k-6}$



SOLVING RATIONAL EQUATIONS WORKSHEET KEY

Solve each equation:

$$1. \quad \frac{2a-3}{6} = \frac{2a}{3} + \frac{1}{2}$$

$$6\left(\frac{2a-3}{6}\right) = 6\left(\frac{2a}{3}\right) + 6\left(\frac{1}{2}\right)$$

$$2a - 3 = 2(2a) + 3(1)$$

$$2a - 3 = 4a + 3$$

$$-3 = 2a + 3$$

$$-6 = 2a$$

$$-3 = a$$

Check:

$$\frac{2(-3)-3}{6} = \frac{2(-3)}{3} + \frac{1}{2}$$

$$\frac{-3}{2} = -2 + \frac{1}{2}$$

$$-1\frac{1}{2} = -1\frac{1}{2}$$

$$2. \quad \frac{2b-3}{7} - \frac{b}{2} = \frac{b+3}{14}$$

$$14\left(\frac{2b-3}{7}\right) - 14\left(\frac{b}{2}\right) = 14\left(\frac{b+3}{14}\right)$$

$$2(2b-3) - 7(b) = 1(b+3)$$

$$4b - 6 - 7b = b + 3$$

$$-9 = 4b$$

$$-\frac{9}{4} = b$$

Check:

$$2\left(\frac{-9}{4}\right) - 3 - \frac{-9}{2} = \frac{-9}{4} + 3$$

$$\frac{-9}{2} - 3 - \frac{-9}{2} = \frac{-9}{4} + 3$$

$$\frac{-15}{2} - \frac{-9}{2} = \frac{3}{4}$$

$$\frac{-15}{2} + \frac{9}{2} = \frac{3}{4}$$

$$\frac{-6}{2} = \frac{3}{4}$$

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

“x” cannot equal “0”

$$3. \quad \frac{3}{5x} + \frac{7}{2x} = 1$$

$$10x\left(\frac{3}{5x}\right) + 10x\left(\frac{7}{2x}\right) = 10x(1)$$

$$2(3) + 5(7) = 10x$$

$$6 + 35 = 10x$$

$$41 = 10x$$

$$\frac{41}{10} = x$$

Check → $\frac{3}{5\left(\frac{41}{10}\right)} + \frac{7}{2\left(\frac{41}{10}\right)} = 1$

$$\frac{3}{205} + \frac{7}{82} = 1$$

$$\frac{30}{205} + \frac{70}{82} = 1$$

1 = 1

“k” cannot equal “-2”
or “0”

$$4. \frac{5k}{k+2} + \frac{2}{k} = 5$$

$$k(k+2) \frac{5k}{1(k+2)} + k(k+2) \frac{2}{k} = k(k+2)5$$

$$5k^2 + 2k + 4 = 5k^2 + 10k$$

$$2k + 4 = 10k$$

$$4 = 8k$$

$$\frac{1}{2} = k$$

$$\frac{5\left(\frac{1}{2}\right)}{\frac{1}{2} + 2} + \frac{2}{\frac{1}{2}} = 5$$
$$\frac{5}{\frac{5}{2}} + 4 = 5$$

$$5 = 5$$

$$5. \frac{m}{m+1} + \frac{5}{m-1} = 1$$

“m” cannot equal “-1” or “1”

$$(m+1)(m-1) \frac{m}{1(m+1)} + (m+1)(m-1) \frac{5}{1(m-1)} = (m+1)(m-1)1$$

$$(m-1)m + (m+1)(5) = (m+1)(m-1)$$

$$m^2 - m + 5m + 5 = m^2 - 1$$

$$4m + 5 = -1$$

$$4m = -6$$

$$m = -\frac{3}{2}$$

Check → $\frac{-\frac{3}{2}}{\frac{3}{2} + 1} + \frac{5}{-\frac{3}{2} - 1} = 1$

$$\frac{-\frac{3}{2}}{\frac{1}{2}} - \frac{5}{\frac{5}{2}} = 1$$

$$6 - 5 = 1$$

$$1 = 1$$

$$6. \frac{4x}{3x-2} + \frac{2x}{3x+2} = 2$$

“x” cannot equal $\frac{2}{3}$ or $-\frac{2}{3}$

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

$$(3x+2)4x + (3x-2)2x = 18x^2 - 8$$

$$12x^2 + 8x + 6x^2 - 4x = 18x^2 - 8$$

$$4x = -8$$

$$x = -2$$

Check → $\frac{4(-2)}{3(-2)-2} + \frac{2(-2)}{3(-2)+2} = 2$

$$\frac{-8}{-8} + \frac{-4}{-4} = 2$$

$$1 + 1 = 2$$

$$2 = 2$$

“p” is not equal to “5”

$$7. \frac{5}{5-p} - \frac{p^2}{5-p} = -2$$

Check → $\frac{5}{5-5} - \frac{(-5)^2}{5-5} = -2$

$$\frac{1}{2} - \frac{5}{2} = -2 \rightarrow -2 = -2$$

$$\frac{5-p^2}{5-p} = -2$$

$$(5-p)\frac{5-p^2}{1(5-p)} = (5-p)(-2)$$

$$5 - p^2 = -10 + 2p$$

$$0 = p^2 + 2p - 15$$

$$0 = (p+5)(p-3)$$

$$p = -5 \text{ or } 3$$

Check → $\frac{5-3^2}{5-3} = -2$

$$\frac{-4}{2} = -2$$

$$-2 = -2$$

$$8. \frac{2a-3}{a-3} - 2 = \frac{12}{a+3}$$

“a” cannot equal “3” or “-3”

$$(a-3)(a+3) \frac{2a-3}{1(a-3)} - (a-3)(a+3)2 = (a-3)(a+3) \frac{12}{1(a+3)}$$

$$(a+3)(2a-3) - 2a^2 + 18 = (a-3)(12)$$

$$2a^2 + 3a - 9 - 2a^2 + 18 = 12a - 36$$

$$3a + 9 = 12a - 36$$

$$45 = 9a$$

$$5 = a$$

Check → $\frac{2(5)-3}{5-3} - 2 = \frac{12}{5+3}$

$$\frac{7}{2} - 2 = \frac{12}{8}$$

$$\frac{3}{2} = \frac{3}{2}$$

$$9. \frac{2b-5}{b-2} - 2 = \frac{3}{b+2}$$

“b” cannot equal “2 or “-2”

$$(b-2)(b+2) \frac{2b-5}{1(b-2)} - (b-2)(b+2)2 = (b-2)(b+2) \frac{3}{1(b+2)}$$

$$(b+2)(2b-5) - 2b^2 + 8 = (b-2)3$$

$$2b^2 - b - 10 - 2b^2 + 8 = 3b - 6$$

$$-b - 2 = 3b - 6$$

$$4 = 4b$$

$$1 = b$$

Check → $\frac{2(1)-5}{1-2} - 2 = \frac{3}{1+2}$

$$\frac{-3}{-1} - 2 = \frac{3}{3}$$

$$1 = 1$$

$$10. \frac{4}{k^2 - 8k + 12} = \frac{k}{k - 2} + \frac{1}{k - 6}$$

“k” cannot equal “2” or “6”

$$(k - 2)(k - 6) \frac{4}{(k - 2)(k - 6)} = (k - 2)(k - 6) \frac{k}{1(k - 2)} + (k - 2)(k - 6) \frac{1}{1(k - 6)}$$

$$4 = (k - 6)k + (k - 2)1$$

$$4 = k^2 - 6k + k - 2$$

$$0 = k^2 - 5k - 6$$

$$0 = (k - 6)(k + 1)$$

$$k = 6 \text{ or } -1$$

Since “k” cannot equal “6” the solution is “-1”

$$\text{Check} \rightarrow \frac{4}{(-1)^2 - 8(-1) + 12} = \frac{-1}{-1 - 2} + \frac{1}{-1 - 6}$$

$$\frac{4}{21} = \frac{1}{3} - \frac{1}{7}$$

$$\frac{4}{21} = \frac{4}{21}$$