

## Solving Rational Equations HW

Solve each equation. Remember to check for extraneous solutions.

1)  $\frac{1}{5} + \frac{1}{5r} = \frac{4r+4}{r}$  CD: 5r

$$\frac{r}{5r} + \frac{1}{5r} = \frac{5(4r+4)}{5r}$$

$$r+1 = 20r+20$$
$$-19 = 19r$$

$$r = -1$$

2)  $\frac{v+5}{v} = \frac{1}{2} + \frac{1}{6v}$  CD: 6v

$$\frac{6(v+5)}{6v} = \frac{3v}{6v} + \frac{1}{6v}$$

$$6v+30 = 3v+1$$
$$3v = -29$$

$$v = \frac{-29}{3}$$

3)  $\frac{2}{3v^2} - \frac{1}{3v} = \frac{v+7}{2v^2}$  CD: 6v<sup>2</sup>

$$\frac{4}{6v^2} - \frac{2v}{6v^2} = \frac{3(v+7)}{6v^2}$$

$$4 - 2v = 3v + 21$$
$$-17 = 5v$$

$$v = \frac{-17}{5}$$

4)  $\frac{5}{8} = \frac{1}{8r} + \frac{r+8}{2r}$  CD: 8r

$$\frac{5r}{8r} = \frac{1}{8r} + \frac{4(r+8)}{8r}$$

$$5r = 1 + 4r + 32$$
$$5r = 4r + 33$$

$$r = 33$$

5)  $\frac{n^2 - 7n + 10}{2n} = \frac{2}{n} + \frac{4n^2 - 16n - 48}{3n}$

6)  $\frac{x}{4} = \frac{1}{2} - \frac{x^2 + 3x - 10}{4x}$

7)  $\frac{5}{6r^2} + \frac{1}{6} = \frac{1}{r^2}$  CD: 6r<sup>2</sup>

$$\frac{5}{6r^2} + \frac{r^2}{6r^2} = \frac{6}{6r^2}$$

$$5 + r^2 = 6$$
$$r^2 = 1$$

$$r = \pm 1$$

8)  $\frac{2v-4}{v} = \frac{2}{v} - \frac{(v+3)}{1}$  CD: v

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

$$2v-4 = 2 - v^2 - 3v$$

$$v^2 + 2v - 3 = 0$$

-1-

$$(v+3)(v-1) = 0$$

$$v^2 + 5v - 6 = 0$$
$$(v+6)(v-1) = 0$$
$$v = -6 \quad v = 1$$

$$v = -3$$
$$v = 1$$

9)  $\frac{1}{x+5} = \frac{1}{x} - \frac{x+6}{x^2+5x}$  CD:  $x(x+5)$

$$\frac{1x}{x(x+5)} = \frac{1(x+5)}{x(x+5)} - \frac{x+6}{x(x+5)}$$

$$x = x+5 - x-6$$

$$x = -11$$

10)  $\frac{3}{n-4} + \frac{5}{2n^2-8n} = \frac{1}{n^2-4n}$  CD:  $2n(n-4)$

$$\frac{2n \cdot 3}{2n(n-4)} + \frac{5}{2n(n-4)} = \frac{2}{2n(n-4)}$$

$$6n+5 = 2$$

$$6n = -3$$

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

11)  $\frac{6}{2b^2+b} + \frac{1}{b} = \frac{5}{2b^2+b}$  CD:  $b(2b+1)$

$$\frac{6}{b(2b+1)} + \frac{2b+1}{b(2b+1)} = \frac{5}{b(2b+1)}$$

$$6+2b+1 = 5$$

$$2b = -2$$

$$b = -1$$

12)  $\frac{3}{p^2-6p} = \frac{1}{p^2-6p} - \frac{1}{p}$  CD:  $p(p-6)$

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

$$3 = 1 - p + 6$$

$$-4 = -p$$

$$p = 4$$

13)  $1 - \frac{1}{x^2+4x} = \frac{4}{x^2+4x}$  CD:  $x(x+4)$

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

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

$$x = -5$$

$$x = 1$$

$$x^2+4x-1 = 4$$

$$x^2+4x-5 = 0$$

14)  $\frac{x^2+3x-4}{x} = x-3 - \frac{1}{x}$  CD:  $x$

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

$$x^2+3x-4 = x^2-3x-1$$

$$3x-4 = -3x-1$$

$$6x = 3$$

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

15)  $\frac{1}{x+4} = \frac{1}{x^2+4x} - \frac{5x+3}{x^3+4x^2}$  CD:  $x^2(x+4)$

$$\frac{1 \cdot x^2}{x^2(x+4)} = \frac{1 \cdot x}{x^2(x+4)} - \frac{5x+3}{x^2(x+4)}$$

$$x^2+4x+3 = 0$$

$$(x+3)(x+1) = 0$$

$$x = -3$$

$$x = -1$$

$$x^2 = x - 5x - 3$$

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