

PAP Algebra 2 Evaluate

Name: key ★

9.3 Solving Rational Equations

Solve for x showing all your work. Check for any excluded values.

$$1. \frac{1}{6k^2} = \frac{2}{3k^2} - \frac{1}{k}$$

$$\frac{1}{6k^2} = \frac{2}{6k^2} - \frac{6k}{6k^2}$$

$$1 = 2 - 6k$$

$$-6k = -1$$

$$\boxed{k = 1/6}$$

$$\boxed{k \neq 0}$$

$$2. \frac{2}{2n^2} + \frac{1}{n} = \frac{1}{2n^2}$$

$$\frac{2}{2n^2} + \frac{2n}{2n^2} = \frac{1}{2n^2}$$

$$2 + 2n = 1$$

$$2n = -1$$

$$\boxed{n = -1/2}$$

$$\boxed{n \neq 0}$$

$$3. \frac{(v-5)}{(v-5)} \frac{1}{v} + \frac{3v+12}{v^2-5v} = \frac{7v-56}{v^2-5v}$$

$$v-5 + 3v+12 = 7v-56$$

$$4v+7 = 7v-56$$

$$\begin{array}{r} 7 = 3v - 56 \\ +56 \end{array}$$

$$63 = 3v$$

$$\boxed{v = 21}$$

$$\boxed{v \neq 0, 5}$$

$$4. \frac{(r-5)}{(r-5)} \frac{1}{r-2} + \frac{1}{r^2-7r+10} = \frac{6}{r-2} \frac{r-5}{r-5}$$

$$r-5 + 1 = 6r-30$$

$$r-4 = 6r-30$$

$$-4 = 5r-30$$

$$5r = 26$$

$$\boxed{r = 26/5}$$

$$\boxed{r \neq 2, 5}$$

$$1 = \frac{v+2}{v-4} + \frac{7v-42}{v-4}$$

$$5. \quad \frac{1}{1} = \frac{8v-40}{v-4}$$

$$v-4 = 8v-40$$

$$-v \quad -v$$

$$-4 = 7v-40$$

$$+4v \quad +4v$$

$$7v = 36$$

$$v = 36/7$$

$$v \neq 4$$

$$7. \quad \frac{n+5}{n+8} = 1 + \frac{6}{n+1}$$

$$\frac{(n+5)}{(n+8)} - \frac{6(n+8)}{(n+1)(n+8)} = 1$$

$$\frac{n^2+6n+5}{n^2+9n+8} - \frac{6n-48}{n^2+9n+8} = 1$$

$$\frac{n^2-43}{n^2+9n+8} = \frac{1}{1}$$

$$n^2+9n+8 = n^2-43$$

$$9n+8 = -43$$

$$-8 \quad -8$$

$$9n = -51$$

$$n = -51/9 \text{ or } -17/3$$

$$n \neq -1, -8$$

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

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

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

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

$$-x-1 = 2x$$

$$-1 = 3x$$

$$x \neq 0, -2$$

$$8. \quad \frac{5}{n^3+5n^2} = \frac{4n^2}{n+5n^2} + \frac{1}{n^2} \frac{n+5}{n+5}$$

$$5 = 4n^2 + n + 5$$

$$0 = 4n^2 + n$$

$$0 = n(4n+1)$$

$$n = 0$$

$$4n+1=0$$

$$n = -1/4$$

$$n \neq 0, -5$$