3/4/2022

WeBWorkset: Fractional Equations

#8) $\frac{1}{2}y - 2y^{-1} = 0$

$\frac{y}{2} - \frac{2}{y} = 0$ > Find the LCD & multiply both sides of the equation by it!

LCD = $2y$

$2y\left(\frac{y}{2} - \frac{2}{y}\right) = 2y \cdot 0$

$\frac{2y}{1} \cdot \frac{y}{2} - \frac{2y}{1} \cdot \frac{2}{y} = 0$

$y^2 - 4 = 0$

$y^2 - 2^2 = 0$

Factor + solve!

$(y-2)(y+2)=0$

$y-2=0$ $\quad y+2=0$

$\boxed{y=2}$ $\quad \boxed{y=-2}$

You check in original!

$\boxed{y=2}$ $\quad \frac{1}{2}\cdot 2-\frac{2}{2}\overset{?}{=}0$

$1-1\overset{\checkmark}{=}0$

$y=-2$ $\quad \frac{1}{2}\cdot(-2)-\frac{(-2)}{2}\overset{?}{=}0$

Keep both solutions! $-1+1\overset{\checkmark}{=}0$

Multiplying Radical Expressions

Reminder: $\sqrt[\text{index}]{a}\cdot\sqrt[n]{b}$ ← radicand

$=\sqrt[n]{a\cdot b}$

Ex $-\sqrt{3xy} \cdot \sqrt{15x^8y}$

$= -\sqrt{3xy \cdot 15x^8y}$ multiply

$= -\sqrt{45x^9y^2}$) try to simplify!

$= -\sqrt{9x^2 \cdot x^2 \cdot x^2 \cdot x^2 y^2} \cdot \sqrt{5x}$

$= -3x^4y \cdot \sqrt{5x}$

Dividing Radicals: Rationalizing Denominators

Reminder: $\sqrt{\frac{36}{9}} = \frac{\sqrt{36}}{\sqrt{9}} = \frac{6}{3}$

$= 2$

Sometimes Given:

$\frac{5}{\sqrt{5}}$ To get rid of a radical in a denominator multiply numerator & denominator by that same radical

Ex $\frac{5}{\sqrt{5}}\left(\frac{\sqrt{5}}{\sqrt{5}}\right) = \boxed{\frac{5\sqrt{5}}{5}}$ proper form

detail: $\sqrt{5}\cdot\sqrt{5} = \sqrt{5\cdot 5}$

$= \sqrt{25} = 5$

Ex $\frac{5}{2+\sqrt{5}}$ Here, in orders to get rid of the radical in the denominator we must multiply by the

Conjugate $\longrightarrow 2+\sqrt{5}$

its conjugate $2-\sqrt{5}$

$$\frac{5\cdot(2-\sqrt{5})}{(2+\sqrt{5})(2-\sqrt{5})} = \frac{10-5\sqrt{5}}{4-2\sqrt{5}+2\sqrt{5}-(\sqrt{5})^2}$$

"FOIL" this!

$$= \frac{10-5\sqrt{5}}{4-5}$$

$$= \frac{10-5\sqrt{5}}{-1} = \boxed{-10+5\sqrt{5}}$$

$$(\sqrt{5})^2 = \sqrt{5^2} = \sqrt{25} = 5$$

PEMDAS! order of operations

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