

November 17, 2017

#12) $\frac{x+6}{x^2+5x-6}$

Simplifying Steps

① Completely factor the numerator & denominator

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

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#14) $\frac{x^2-11x+18}{x^2+2x-8}$

$$\frac{(x-9)(x-2)}{(x+4)(x-2)} = \frac{x-9}{x+4}$$

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#17) $\frac{b^2+3b-28}{b^2-49}$

b^2-49 ← Diff. of Two Squares

$$\frac{(b+7)(b-4)}{(b+7)(b-7)} = \frac{b-4}{b-7}$$

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7.4 Solving Rational Equations

LCD: $15x$

$$15x \left(\frac{1}{x} - \frac{1}{3} = \frac{1}{5} \right)$$

$$\left[\frac{15x}{1} \cdot \frac{1}{x} \right] - \left[\frac{15x}{1} \cdot \frac{1}{3} \right] = \left[\frac{15x}{1} \cdot \frac{1}{5} \right]$$

$$15 - 5x = 3x$$

$$\frac{15}{8} = \frac{8x}{8}$$

$$\frac{15}{8} = x$$

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$x^2 \left(\frac{18}{1} + \frac{11}{x} = -\frac{1}{x} \right)$ LCD: x^2

$$18x^2 + 11x = -1$$

Quadratic or Degree 2 → Get everything to one side & set the other equal to zero.

$$18x^2 + 11x + 1 = 0$$

$ac=18$
 $b=11$
 $\frac{+}{-}$
 $\frac{+}{+}$

$$18x^2 + 9x + 2x + 1 = 0$$

$$9x(2x+1) + (2x+1) = 0$$

$$(2x+1)(9x+1) = 0$$

① $2x+1=0$
 $2x=-1$
 $x=-\frac{1}{2}$

② $9x+1=0$
 $9x=-1$
 $x=-\frac{1}{9}$

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The Zero Factor Theorem

$a \cdot b = 0$

- ① $a = 0$
- ② $b = 0$
- ③ $a \neq b = 0$

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$(x+4)(x+3) = 0$
 $x^2 + 7x + 12 = 0$ ① $x = -4$
 ② $x = -3$

$(x+4)^2 = 0$
 $(x+4)(x+4) = 0$
 ① $x+4 = 0$
 $x = -4$
 ② $x+4 = 0$
 $x = -4$

} two solutions

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$\frac{1}{2} \neq \frac{1}{4}$
 $\frac{1}{2} \neq \frac{1}{2^2}$

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