2.7A HW

Sunday, October 5, 2014 10:55 AM

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① $x=1$ ② $x=-5,3$ ③ $x=-7,2$ ④ $x=\frac{11\pm\sqrt{73}}{8}$ ⑤ $x=-4$ ⑥ $x=\frac{13\pm\sqrt{105}}{16}$

⑦ $x=2,5$ ⑧ $x=-5,3$ ⑨ $x=3,4$ ⑩ $x=-6,-1$ ⑪ $x=\frac{1}{2}$ ⑫ $x=3/2$

⑬ $x=-1/3$

Solutions

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

$x-2+x+5=1$

$2x+3=1$

$2x=-2$

$x=1$

② $x\cdot\frac{x}{x}+2\cdot\frac{x}{x}=\frac{15}{x}$

$\frac{x^2}{x}+\frac{2x}{x}=\frac{15}{x}$

$x^2+2x=15$

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

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

$x=-5,3$

check!

$-5+2=\frac{15}{-5}$

$-3=-3$ ✓

$3+2=\frac{15}{3}$

$5=5$ ✓

③ $x\frac{x}{x}+5\frac{x}{x}=\frac{14}{x}$

$\frac{x^2}{x}+\frac{5x}{x}=\frac{14}{x}$

$x^2+5x=14$

$x^2+5x-14=0$

$(x+7)(x-2)=0$

$x=-7,2$

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

$\frac{x-3}{x(x-3)}-\frac{2x}{x(x-3)}=\frac{4x^2-12x}{x(x-3)}$

$x-3-2x=4x^2-12x$

$-x-3=4x^2-12x$

$0=4x^2-11x+3$

$x=\frac{11\pm\sqrt{121-4(12)}}{2(4)}$

$x=\frac{11\pm\sqrt{73}}{8}$

⑤ $x\cdot\frac{x-3}{x-3}+\frac{4x}{x-3}=\frac{12}{x-3}$

$x^2-3x+4x=12$

$x^2+x-12=0$

$(x+4)(x-3)=0$

$x=-4,\cancel{3}$ ↑ extraneous

⑥ $\frac{3}{x-1}\cdot\frac{x}{x}+\frac{2}{x}\frac{(x-1)}{(x-1)}=8x(x-1)$

$3x+2x-2=8x^2-8x$

$5x-2=8x^2-8x$

$0=8x^2-13x+2$

$x=\frac{13\pm\sqrt{169-4(16)}}{2(8)}$

$x=\frac{13\pm\sqrt{105}}{16}$

⑦ $x\cdot\frac{x}{x}+\frac{10}{x}=7\cdot\frac{x}{x}$

$x^2+10=7x$

$x^2-7x+10=0$

$(x-5)(x-2)=0$

$x=2,5$

⑧ $x\cdot\frac{x}{x}+2\cdot\frac{x}{x}=\frac{15}{x}$

$x^2+2x=15$

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

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

$x=-5,3$

⑨ $x\cdot\frac{x}{x}+\frac{12}{x}=7\cdot\frac{x}{x}$

$x^2+12=7x$

$x^2-7x+12=0$

$(x-4)(x-3)=0$

$x=3,4$

⑩ $x\frac{x}{x}+\frac{6}{x}=-7\frac{x}{x}$

$x^2+6=-7x$

⑪ $2\frac{x(x+1)}{x(x+1)}-\frac{1}{x+1}\frac{x}{x}=\frac{1}{x(x+1)}$

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

⑫ $2\frac{x^2+4x}{x^2+4x}-\frac{3}{x+4}\frac{x}{x}=\frac{12}{x(x+4)}$

$2x^2+8x-3x=12$

(10) $x\left(\frac{x}{x}+\frac{6}{x}=-7\frac{x}{x}\right)$

$x^2+6=-7x$

$x^2+7x+6=0$

$(x+6)(x+1)=0$

$x=-6,-1$

(11) $2\frac{x(x+1)}{x(x+1)}-\frac{1}{x+1}\frac{x}{x}=\frac{1}{x(x+1)}$

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

$2x^2+x-1=0$

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

$x=1/2,$ ~~-1~~ ← extraneous!

(12) $2\frac{x^2+4x}{x^2+4x}-\frac{3}{x+4}\frac{x}{x}=\frac{12}{x(x+4)}$

$2x^2+8x-3x=12$

$2x^2+5x=12$

$2x^2+5x-12=0$

$(2x-3)(x+4)=0$

$x=3/2,$ ~~-4~~

(13) $\frac{3x}{x+5}\frac{(x-2)}{(x-2)}+\frac{1}{x-2}\frac{(x+5)}{(x+5)}=\frac{7}{(x+5)(x-2)}$

$3x^2-6x+x+5=7$

$3x^2-5x-2=0$

$(3x+1)(x-2)=0$

$x=-1/3,$ ~~2~~