PING YI SECONDARY SCHOOL

Perseverance Yields Success

Name Huang Hsiang 4Y Class 302

Subject E-Math No. 20 Date 21/4/2009

Ex 2.5 <Pg 44>

1 a) $x+\frac{1}{x}=2$

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

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

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

$x^2+1=2(x)$

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

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

$x=1$ #

c) $\frac{x-1}{2x-5}=\frac{x-6}{x+2}$

$(x-1)(x+2)=(x-6)(2x-5)$

$x^2+x-2=2x^2-17x+30$

$x^2+x-2-2x^2+17x-30=0$

$0=x^2-18x+32$

$(x-16)(x-2)=0$

$x=16$ # or $x=2$ #

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

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

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

$\frac{x-2}{5}=\frac{2x-4}{2x-3}$

$(x-2)(2x-3)=5(2x-4)$

$2x^2-4x-3x+6=10x-20$

$2x^2-7x+6=10x-20$

$2x^2-7x+6-10x+20=0$

$2x^2-17x+26=0$

$(2x-13)(x-2)=0$

$x=\frac{13}{2}$ # or $x=2$ #

1 g) $\frac{(x-2)(x-3)}{(x-1)(x-5)} = \frac{5}{3}$

$5(x-1)(x-5) = 3(x-2)(x-3)$

$5(x^2-x-5x+5) = 3(x^2-2x-3x+6)$

$5(x^2-6x+5) = 3(x^2-5x+6)$

$5x^2-30x+25 = 3x^2-15x+18$

$5x^2-30x+25-3x^2+15x-18 = 0$

$2x^2-15x+7 = 0$

$(2x-1)(x-7) = 0$

$x = \frac{1}{2}$ # $\quad x = 7$ #

$2x$	-1	$-1x$
x	-7	$-14x$
$2x^2$	7	$-15x$

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

$\frac{3}{x-1} - \frac{2x+10}{(x-1)(x+3)} = \frac{1}{3}$

$\frac{3(x+3)}{(x-1)(x+3)} - \frac{2x+10}{(x-1)(x+3)} = \frac{1}{3}$

$\frac{3x+9-2x-10}{(x-1)(x+3)} = \frac{1}{3}$

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

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

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

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

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

$0 = x^2-x$

$x = 0$ # or $x = 1$ (reject)

2f) $\frac{5}{x-15} - \frac{2}{x+6} = \frac{3}{x-9}$

$\frac{5(x+6)-2(x-15)}{(x-15)(x+6)} = \frac{3}{x-9}$

$\frac{5x+30-2x+30}{(x-15)(x+6)} = \frac{3}{x-9}$

$\frac{3x+60}{(x-15)(x+6)} = \frac{3}{x-9}$

$3(x-15)(x+6) = (3x+60)(x-9)$

$3(x^2-15x+6x-90) = 3x^2+60x-27x-540$

$3(x^2-9x-90) = 3x^2+33x-540$

$3x^2-27x-270 = 3x^2+33x-540$

$0 = 3x^2+33x-540-3x^2+27x+270$

$0 = 60x-270$

$60x = 270$

$x = \frac{270}{60} = 4\frac{1}{2}$ #

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3. Let x be the number

$\frac{1}{x}$ ← reciprocal

$\frac{x}{1} \times \frac{1}{x} = \frac{25}{12}$

$\frac{x^2+1}{x} = \frac{25}{12}$

$12(x^2+1) = 25(x)$

$12x^2+12 = 25x$

$12x^2-25x+12 = 0$

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

$x = \frac{3}{4}$ # or $x = \frac{4}{3}$ #

4. 144 sweets $x-4$

x students

$\frac{144}{x-4} - \frac{144}{x} = 6$

$\frac{144x-144(x-4)}{x^2-4x} = 6$

$\frac{144x-144x+576}{x^2-4x} = 6$

$\frac{576}{x^2-4x} = 6$

$6(x^2-4x) = 576$

$6x^2-24x = 576$

$6x^2-24x-576 = 0$

$x^2-4x-96 = 0$

$x = \frac{-(-4) \pm \sqrt{(-4)^2-4(1)(-96)}}{2(1)}$

$x = \frac{4 \pm \sqrt{16+384}}{2}$

$x = \frac{4 \pm \sqrt{400}}{2}$

$x = 12$ # or $x = -8$ <rejected>