PING YI SECONDARY SCHOOL

Perseverance Yields Success

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Subject A-Math No. 20 Date 7/1/2009.

Ex 1.2 <Pg 4>

1. $y^2-4x=0$ — ①

$2x+y=4$ — ②

②: $y=4-2x$

①: $y^2-4x=0$

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

$16-16x+4x^2-4x=0$

$4x^2-20x+16=0$

$x^2-5x+4=0$

$(x-4)(x-1)=0$

$x=4$ # or $x=1$ #

$y=-4$ # $y=2$ #

Next! 11

2. $x+y=2$ — ①

$2x^2+xy+1=0$ — ②

①: $x=2-y$

②: $2x^2+xy+1=0$

$2(2-y)^2+(2-y)y+1=0$

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

$8-8y+2y^2+2y-y^2+1=0$

$y^2-6y+9=0$

$(y-3)=0$

$y=3$ #

$x=-1$ #

3. $3x+y=1$ — ①

$x^2+y^2=5$ — ②

①: $y=1-3x$

②: $x^2+(1-3x)^2=5$

$x^2+1-6x+9x^2=5$

$x^2+1-6x+9x^2-5=0$

$10x^2-6x-4=0$

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

$(5x+2)(x-1)=0$

$x=-\frac{2}{5}$ # or $x=1$ #

$y=\frac{11}{5}$ # $y=-2$ #

FALCON

4 $3s^2+2t^2=11$ —①

$3s+2t=1$ —②

②: $2t=1-3s$

$t=\frac{1-3s}{2}$

① $3s^2+2t^2=11$

$3s^2+2(\frac{1-3s}{2})^2=11$

$3s^2+2(\frac{1-6s+9s^2}{4})-11=0$ ×4

$12s^2+2(1-6s+9s^2)-44=0$

$12s^2+2-12s+18s^2-44=0$

$30s^2-12s-42=0$

$5s^2-2s-7=0$

$(5s-7)(s+1)=0$

$s=\frac{7}{5}$ # or $s=-1$ #

$t=-\frac{8}{5}$ # $t=2$ #

5. $x+y=5$ —①

$(x+1)^2+(y+1)^2=25$ —②

①: $x=5-y$

②: $(x+1)^2+(y+1)^2=25$

$(5-y+1)^2+(y+1)^2=25$

$(-y+6)^2+(y+1)^2=25$

$y^2-12y+36+y^2+2y+1-25=0$

$2y^2-10y+12=0$

$y^2-5y+6=0$

$(y-3)(y-2)=0$

$y=3$ # $y=2$ #

$x=2$ # $x=3$ #

6. $3x-2y=1$ — ①

$(x-2)^2+(2y+3)^2=26$ — ②

① : $3x=1+2y$

$x=\frac{1+2y}{3}$

② : $\left(\frac{1+2y}{3}-2\right)^2+(2y+3)^2=26$

$\left(\frac{-5+2y}{3}\right)^2+(2y+3)^2=26$

$\left(\frac{25-20y+4y^2}{9}\right)+(4y^2+12y+9)=26$

$25-20y+4y^2+9(4y^2+12y+9)=26\times 9$

$25-20y+4y^2+36y^2+108y+81-234=0$

$40y^2+88y-128=0$

$5y^2+11y-16=0$

$(5y+16)(y-1)=0$

$y=-\frac{16}{5}$ # or $y=1$

$x=-\frac{9}{5}$ # $x=1$

7. $x^2-2xy+y^2=1$ — ①

$x-2y=2$ — ②

② : $x=2+2y$

① : $x^2-2xy+y^2=1$

$(2+2y)^2-2(2+2y)y+y^2=1$

$(4+8y+4y^2)-(4y+4y^2)+y^2-1=0$

$y^2+4y+3=0$

$(y+3)(y+1)=0$

$y=-3$ # or $y=-1$ #

$x=-4$ # $x=0$ #

8 $3y - x = 3$ — ①

$\frac{2}{3y} - \frac{1}{x} = 2$ — ②

① $-x = \frac{3}{3y}$, $x = -\frac{3}{3y}$

② $\frac{2}{3y} - \frac{1}{\left(\frac{3}{3y}\right)} = 2$

$\frac{2}{3y} - (1x - \frac{3y}{3}) - 2 = 0$

$\frac{2}{3y} + \frac{3y}{3} - 2 = 0$

$3y\left(\frac{2}{3y} + y - 2\right) = 0$ ← how did you get this?

$2 + 3y^2 - 4y = 0$

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

$(y-1)(y-1) = 0$

$y = 1$ # ✗

$x = 0$ # ✗

$3y - x = 3$ — ①

$\frac{2}{3y} - \frac{1}{x} = 2$ — ②

sub $x = 3y - 3$ — ③ into ②

$\frac{2}{3y} - \frac{3}{3y-3} = 2$

$\frac{2(3y-3) - 3(3y)}{3y(3y-3)} = 2$

$\frac{6y - 6 - 3y}{9y^2 - 9y} = 2$

$6y - 6 - 3y = 2(9y^2 - 9y)$

$6y - 6 - 3y = 18y^2 - 18y$

$6y - 6 - 3y - 18y^2 + 18y = 0$

$-18y^2 + 21y - 6 = 0$ C

$0 = 6y^2 - 7y + 2$

$(3y - 1)(3y - 2) = 0$ 15/1/09

$y = \frac{1}{3}$ # $y = \frac{2}{3}$ #

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

9 $2x + 5y + 4 = 0$ — ①

$2xy = -1$ — ②

① : $2x = -4 - 5y$

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

② $= 2x\frac{-4-5y}{2}xy = -1$

$-4 - 5yxy = -1$

$-4y - 5y^2 + 1 = 0$

$-5y^2 - 4y + 1 = 0$

$(-5y + 1)(y + 1) = 0$

$y = \frac{1}{5}$ # or $y = -1$ #

$x = -\frac{5}{2}$ # $x = 0.5$ #

$\left[-\frac{5}{2}, \frac{1}{5}\right]$ ✓N $[0.5, -1]$ ✓N

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10) $xy + 20 = 5x$ —— ①

$2y = x - 3$ —— ②

② $y = \frac{x-3}{2}$

① $\left(\frac{x-3}{2}\right)x + 20 = 5x$

$\frac{x^2-3x}{2} + 20 - 5x = 0$

$x^2 - 3x + 40 - 10x = 0$

$x^2 - 13x + 40 = 0$

$(x-5)(x-8)$

$x = 5$ or $x = 8$

$y = 1$ $y = \frac{5}{2}$

$[5, 1]$ ✓ $[8, \frac{5}{2}]$ ✗

15/1/09