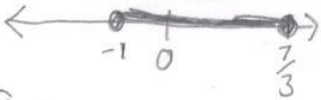


1st Semester Final

① $2x+5=15$ $2x+5=-15$
 $-5 \quad -5$ $-5 \quad -5$
 $2x=10$ $2x=-20$
 $x=5$ $x=-10$

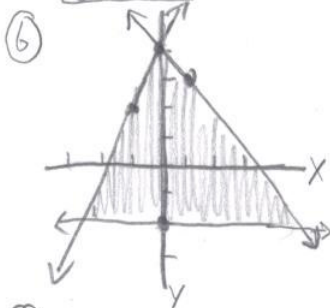
② $3x-2 \leq 5$ and $3x-2 \geq -5$
 $+2 \quad +2$ $+2 \quad +2$
 $3x \leq 7$ $3x \geq -3$
 $x \leq \frac{7}{3}$ and $x \geq -1$
 $-1 \leq x \leq \frac{7}{3}$



③ $3x-2y=3$
 $-2x+2y=0$
 $x=3$ $-2(3)+2y=0$
 $-6+2y=0$
 $(3,3)$ $y=3$

④ $4x-2(2x+1)=-2$
 $4x-4x-2=-2$
 $-2=-2$
 Many solutions

⑤ $3x+2(1-2x)=21$
 $3x+2-4x=21$
 $-x+2=21$
 $-x=19$ $x=-19$
 $y=1-2(-19)$
 $y=1+38$ $y=39$
 $(-19,39)$



⑦ Down, Wide, Right 4, Up 2

⑧ $y=(0)^2-3(0)-6$
 $y=-6$ $(0,-6)$

⑨ 2nd $2x-2y-z=-12$
 3rd $-x+2y+3z=7$
 4th $x+2z=-5$
 1st $-10x+2y+8z=6$
 2nd $2x-2y-z=-12$
 5th $-8x+7z=-6$
 4th $8x+16z=40$
 5th $-8x+7z=-6$
 $23z=46$
 $z=2$
 4th $x+2(2)=-5$
 $x=-1$

1st $5(-1)-y-4(2)=-3$
 $-5-y+8=-3$
 $y=6$ $(-1,6,2)$

⑩ $y=(x+3)(x-1)$
 $y=x^2-x+3x-3$
 $y=x^2+2x-3$

⑪ vertex $(1,4)$
 $y=-(x-1)^2+4$

⑫ $x = \frac{-b}{2a} = \frac{-12}{2(-3)} = \frac{-12}{-6}$
 $x=2$ axis of Sym.
 $y=3(2)^2+12(2)-8$
 $y=-12+24-8=4$
 vertex $(2,4)$

⑬ $x = \frac{-(-8)}{2(-2)} = -2$
 $y=7-8(-2)-2(-2)^2$
 $y=7+16-8=15$
 vertex $(-2,15)$
 a is Neg \curvearrowright

⑭ $x = \frac{-(-6)}{2(-3)} = 1$

$x=1$ axis of Sym

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

⑮ $5 \times \frac{25}{5}$
 $(x+5)(x+5)$
 $(x+5)^2$

⑯ $(x)^2 - (9)^2$
 $(x-9)(x+9)$

⑰ $\frac{18}{-9} = -2$
 $(x-9)(x-2)$
 $(x-3)(3x-2)$

⑱ $\frac{9}{-9} = -1$
 $(x-9)(x-9)=0$
 $x=9$

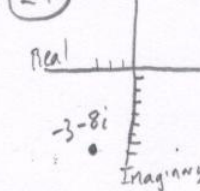
⑲ $x^2-x-20=0$
 $-5 \times 4 = -20$
 $(x-5)(x+4)=0$
 $x=5$ & $x=-4$
 $(5,0)(-4,0)$

⑳ $x^2+2x=35$
 $x^2+2x+1=35+1$
 $\sqrt{(x+1)^2}=36$
 $x+1=\pm 6$
 $x=-1 \pm 6$
 $x=-1+6$ $x=-1-6$
 $x=5$ and $x=-7$

㉑ $x^2-12x+36=0+36$
 $\sqrt{(x-6)^2}=36$
 $x-6=\pm 6$
 $x=6 \pm 6$ $x=0$ & 12

㉒ $x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(3)(-4)}}{2(3)}$
 $x = \frac{4 \pm \sqrt{16+48}}{6}$
 $x = \frac{4 \pm 8}{6}$
 $x = \frac{4+8}{6}$ $x = \frac{4-8}{6}$
 $x = \frac{12}{6}$ $x = \frac{-4}{6}$
 $x = 2$ $x = -\frac{2}{3}$

㉓ Conjugate $(3+6i)(3-6i)$
 $9-18i+18-36i^2$
 $9+36=45$
 $3-6i$



㉔ $-2-3=-5$
 $-7i-8i=-15i$
 $-5-15i$

㉕ $3i(6-5i)$
 $18i-15i^2$
 $18i-15(-1)$
 $15+18i$

㉖ $(2+3i)(1-4i)$
 $2-8i+3i-12i^2$
 $2-5i+12$
 $14-5i$

㉗ $5(1-i)$
 $(1+i)(1-i)$
 $5-5i$
 $1-i^2$
 $5-5i$
 2
 $\frac{5-5i}{2}$

㉘ $-x^2+3x^2=2x^2$
 $2x^2+3x+2$

㉙ $3x^5-x^5=2x^5$
 $2x^5-7x^5=9x^5$
 $2x^5+9x^5$

㉚ $(x-1)(x^2-3x+4)$
 x^3-3x^2+4x
 $-x^2+3x-4$
 x^3-4x^2+7x-4

㉛ $(2x-5)(3x-5)(2x-5)$
 $(4x^2-20x+25)(2x-5)$
 $(2x-5)(4x^2-20x+25)$
 $8x^3-40x^2+50x$
 $-20x^2+100x-125$
 $8x^3-60x^2+150x-125$

㉜ $(4-x^2)-(2-x)$
 $-x^2+x+2$

㉝ $(1-x^2)+(1-x)$
 $-x^2-x+2$

㉞ $16-(4-x)^2$
 $(4-x)(4-x)$
 $16-8x+x^2$
 $16-(x^2-8x+16)$
 $-x^2+8x$

㉟ $f(3)=2(3)-(3)^2$
 $f(3)=6-9$
 $f(3)=-3$

$g(-4)=1-(-4)$
 $g(-4)=5$