# Solutions Algebra 2 team 1/23/93

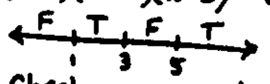
5. $x^3+y^3 = (x+y)(x^2-xy+y^2) = 36$
$= (6)(16-xy) = 36$
$xy = \mathbf{10}$
$\Big\}$ Since $x+y=6$ and $x^2+y^2=16$

6. $b^2-4ac = (2k+6)^2-4(k)(16)=0$
$4k^2+24k+36-64k=0$
$4k^2-40k+36=0$, $4(k^2-10k+9)=0$
$k=9$ or $k=1$

7. Let $u=\frac{1}{x}$, $v=\frac{1}{y}$
$\left.\begin{array}{l} u+v=\frac{7}{10} \\ 3u-5v=\frac{1}{2} \end{array}\right\}$
$10u+10v=7$
$\underline{6u-10v=1}$
$16u \quad = 8$
$u=\frac{1}{2}$; $x=2$
$\frac{1}{2}+v=\frac{7}{10}$, $v=\frac{2}{10}=\frac{1}{5}$, $v=\frac{1}{y}$, $y=5$
Solution $(2,5)$

8. $\underline{1}\rfloor\; 1 \;-9 \;+23 \;-15$
$\quad\quad 1 \;-8 \;15$
$\overline{1 \;-8 \;15 \;\lfloor 0}$

$(x-1)(x-3)(x-5)>0$



Checking intervals

Solution: $\boxed{1<x<3 \text{ or } x>5}$ or $(1,3)\cup(5,+\infty)$

9. $a=17=\sqrt{8^2+15^2}$
$b=(-2i)^5=-32i$
$c=\frac{(3+i)(1+i)}{1-i^2}=\frac{3+4i+i^2}{2}=\frac{2+4i}{2}=1+2i$
$d=(12i+0+36)-(0+-6+36i)=-24i+42$
Sum $= 60+-54i$

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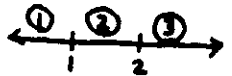
# Solutions: Algebra 2 Team 1/23/93

1. $\frac{f}{gh}=\frac{1}{3}$, $f\circ g(1)=5$, $g\circ f(1)=-1$
$\frac{1}{3}+5-(-1)=6\frac{1}{3}=\boxed{\frac{19}{3}}$

2. $\frac{\left(-\frac{17}{24}+\frac{1}{12}+\frac{2}{3}\right)}{\left(6-\frac{3}{8}-\frac{5}{12}\right)}\frac{24}{24} = \frac{-17+2+16}{144-9-10} = \frac{1}{125}$
Answer $=\left(\frac{1}{125}\right)^{-1/3} = \boxed{5}$

3. $\sqrt{11+6\sqrt{2}} = \sqrt{(3+\sqrt{2})^2} = 3+\sqrt{2}$
$6+2\sqrt{2} = 2(3+\sqrt{2})$
Answer $=\frac{1}{2}=\frac{a}{b}$ so $a\cdot b=\boxed{2}$

4. $|x-1|+|4-2x|=7$



if $x-1>0$ and $4-2x>0$ (interval 2)
$x-1+4-2x=7$
$-x=4$
$x=-4$
$\Big\}$ Not a solution.

if $x-1>0$ and $4-2x<0$
$x>0+1=1$ $\quad x>2$ (interval 3)

$x-1+2x-4=7$
$3x=12$
$x=4$ A solution

if $x-1<0$ and $4-2x>0$ (interval 1)
$1-x+4-2x=7$
$-3x=2$
$x=-2/3$ a solution
Sum $= 4-2/3 = 3\frac{1}{3}$ or $\boxed{10/3}$