SVAR MVE335 11/1 -2018

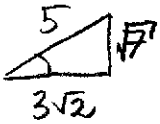
1a $x = (1+\frac{1}{a})/(1-\frac{1}{a^2}) = a/(a-1)$ 1b $2x$ 1c $\frac{(x+2)^2-1}{(x+2)(x+3)} = \frac{x+1}{x+2}$

1d $|2x+3|<4$ $|x-(-\frac{3}{2})|<2$ $-3/2$ (2, 2) $-3.5 < x < 0.5$

2a $\frac{1}{2}+\frac{1}{R}=\frac{12}{5}$ $\frac{1}{R}=\frac{19}{10}$ 2b $(x-3)(x^2+2x-5)$ $x=\frac{-2\pm\sqrt{4-4\cdot1\cdot(-5)}}{2} = -1\pm\sqrt{6}$

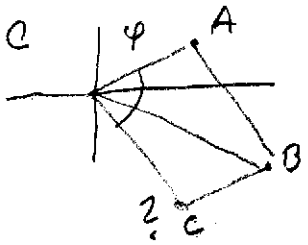
2c $y = 2x+m$ $m = -4-2\cdot3 = -10$ $-5x+2x-10+1=0$ $x=-3$ $y=-16$

2d $(x+4)^2+(y-5)^2 = 40+16+25 = 81$

3a 

3b $\phi = \arctan(-\frac{5}{3}) + 180^\circ = 121^\circ$

$A = \frac{5}{\sin\phi} = 5.8$

3c 

$A+C=B$

$C = B-A = (6,-4)-(4,2)$

$= (2,-6)$

$\cos\varphi = \frac{(4,2)\cdot(2,-6)}{2\sqrt{5}\,2\sqrt{10}} = \frac{-1}{5\sqrt{2}}$

$\varphi = 98.1^\circ$ $\angle A = 180-\varphi = 81.9^\circ$

3d $(2,-7)+t(5,2) = (1,4)+s(7,-1)$

$2+5t = 1+7s$

$-7+2t = 4-s$ $\Rightarrow$ $t=4$ $(22,1)$, $s=3$ EJ kollision

4a $z = \sqrt{29}(\cos(\underbrace{\arctan\tfrac{5}{2}}_{68.2^\circ}) + i\sin 68.2^\circ)$ $w = 4\sqrt{2}(\cos(\underbrace{\arctan\tfrac{4}{-4}+\pi}_{135^\circ}) + i\sin 135^\circ)$

4b $z\cdot w = 16(\cos(\underbrace{35^\circ-145^\circ}_{-110^\circ}) + i\sin(-110^\circ))$ $\frac{z}{w} = 4(\cos(\underbrace{35-(-145)}_{180^\circ}) + i\sin 180^\circ)$

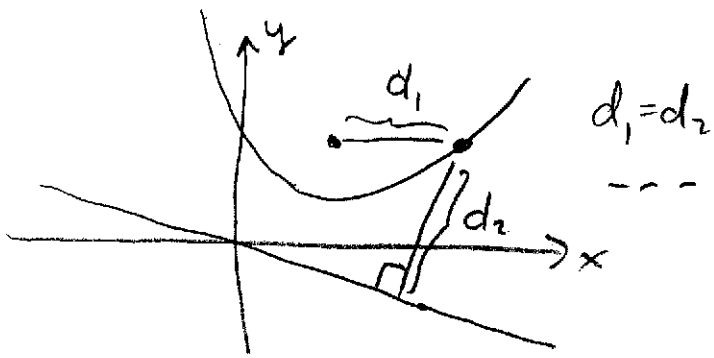
4c $((x+3)^2-(2i)^2)(x^2-4) = x^4+6x^3-4x^2-24x-52$

4d $z^4 = \sqrt{2}^4(\cos\frac{-4\pi}{6} + i\sin\frac{-4\pi}{6}) = 4(\underbrace{\cos\frac{-2\pi}{3}}_{-1/2} + i\underbrace{\sin\frac{-2\pi}{3}}_{-\sqrt{3}/2}) = -2(1+i\sqrt{3})$

5a $z^2 = t$ $t = \ldots \rightarrow$ polar form $z = t^{1/2}\ldots$

5b Additionsformel ...

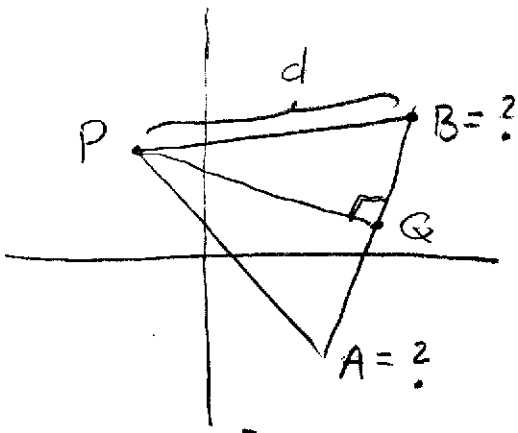
6



$d_1 = d_2$

...

7



$\overrightarrow{AB} \perp \overrightarrow{PQ}$

$A, B = G \pm \frac{d}{2}\frac{\overrightarrow{AB}}{|AB|} = \ldots$