$|a+bi| = \sqrt{a^2+b^2}$

a) $|4+3i| = \sqrt{(4)^2+(3)^2}$

$= \sqrt{16+9}$

$= \sqrt{25} = 5$

c) $2+2i$ Polar form

$r = |2+2i| = \sqrt{(2)^2+(2)^2}$ $\quad \tan\theta = \frac{b}{a} = \frac{2}{2} = 1$

$= \sqrt{4+4} = \sqrt{8} = 2\sqrt{2}$ $\quad \arctan(1) = 45$

$2\sqrt{2}\,(\cos(45) + i\sin(45))$

Standard form

$6(\cos(150) + i\sin(150))$

$6\left(-\frac{\sqrt{3}}{2} + i\left(\frac{1}{2}\right)\right)$

$\frac{-6\sqrt{3}}{2} + \frac{6}{2}i$

$-3\sqrt{3} + 3i$

) $4(\cos(27) + i\sin(27)) \cdot 10(\cos(123) + i(123))$

$4 \cdot 10((\cos 27+123) + i\sin(27+123))$

$40(\cos(150) + i\sin(150))$

$40\left(-\frac{\sqrt{3}}{2} + i\left(\frac{1}{2}\right)\right)$

$\frac{-40\sqrt{3}}{2} + \frac{40}{2}i = -20\sqrt{3} + 20i$

m) $4\vec{v} + 7\vec{w}$

$4\langle 2, 3\rangle + 7\langle 5, \sqrt{3}\rangle$

$\langle 8, 12\rangle + \langle 35, 7\sqrt{3}\rangle$

$\langle 43, 12 + 7\sqrt{3}\rangle$

n) $\vec{v} + 2\vec{w}$

$\langle -11, -6\rangle + \langle 6, -4\rangle$

$\langle -5, -10\rangle$

unit vector

$\langle 8, -6\rangle$

$\|a\| = \sqrt{(8)^2 + (6)^2}$

$= \sqrt{64+36}$

$= \sqrt{100}$

$a = 10$

$\frac{1}{10}\langle 8, -6\rangle$

$\langle \frac{8}{10}, \frac{-6}{10}\rangle$

$\langle \frac{4}{5}, -\frac{3}{5}\rangle$

a) $(5-2i) + (-2+6i)$

$(-3, +4i)$

a) $\|\vec{v}_1\| = 6$ $\quad \theta_1 = 60$

$\|v_2\| = 2$ $\quad \theta_2 = 180$

$\vec{F} = \vec{F_1} + F_2 = \langle 3, 3\sqrt{3}\rangle + \langle -2, 0\rangle$

$\langle 3-2, 3\sqrt{3}+0\rangle$

$\langle 1, 3\sqrt{3}\rangle$

magnitude $a = \sqrt{(1)^2 + (3\sqrt{3})^2}$

$a = \sqrt{1 + 9(3)} = \sqrt{28}$

$\vec{v} = \langle \|\vec{v}\| \cdot \cos\theta, \|\vec{v}\| \cdot \sin\theta\rangle$

$F_1 = \langle 6 \cdot \cos(60), 6 \cdot (\sin 60)\rangle$

$\langle 6 \cdot (\frac{1}{2}), 6 \cdot \frac{\sqrt{3}}{2}\rangle$

$\langle 3, 3\sqrt{3}\rangle$

$F_2 = \langle 2\cos(180), 2\sin(180)\rangle$

$\langle 2 \cdot -1, 2(0)\rangle$

$\langle -2, 0\rangle$

a) $\dfrac{18(\cos(320) + i\sin(320)}{3(\cos(110) + i\sin(110)}$

$\frac{18}{3}(\cos(320-110) + i\sin(320-110))$

$\frac{18}{3}(\cos(210) + i\sin(210)$

$6(-\frac{\sqrt{3}}{2} + i(-\frac{1}{2})$

$-\frac{6\sqrt{3}}{2} + i\ -\frac{6}{2}$

$-3\sqrt{3} - 3i$

a) $a_n = a_1 + d(n-1)$ $\quad a_n = 29 + (n-1)4$

$57 = a_1 + 4(8-1)$

$57 = a_1 + 28$

$-28 \quad -28$

$29 = a_1$

a) $a_1 = 8$ $a_{15} = 92$ $\quad a_{19}$

14

$a_n = a_1 + (n-1)d$

$a_{15} = a_1 + (15-1)d$ $\quad a_{19} = 8 + (19-1)6$

$a_{15} = a_1 + 14d$ $\quad a_{19} = 8 + 102$

$92 = 8 + 14d$ $\quad a_{19} = 110$

$\frac{84}{14} = \frac{14d}{14}$

$d = 6$

Seris $\rightarrow$ $S_n = \frac{P}{2}(a_1 + a_P)$ $a_1 = 4(1)+7$ $a_2 = 4(2)+7$

$a_1 = 11$ $a_2 = 15$

$a_{48} = 11 + (48-1)4$

$d = 15-11$

$d = 4$

$a_{48} = 11 + 188$

$a_{48} = 199$ $S_{48} = \frac{48}{2}(11+199)$

$24(210) = 5040$

a) $\sum_{J=1}^{4} a_J$ $a_J = 5 \cdot 4^{J-1}$ $S_n = a_1 \frac{(1-r^n)}{1-r}$

$a_1 = 5 \cdot 4^{1-1}$

$a_1 = 5$

$S_n = \frac{5(1-(4)^4)}{1-4} = 425$

a). $\sum_{J=1}^{\infty} a_J$ $a_J = 3 \cdot (\frac{2}{3})^{J-1}$ $a_1 \cdot \frac{1}{1-r}$

$3 \cdot \frac{1}{1-(\frac{2}{3})} = 9$

$a_n = a_1 \cdot r^{n-1}$

$a_1 = 3$ $r = 5$

$a_4 = 3 \cdot (5)^{4-1}$

$a_4 = 3 \cdot 125$

$a_4 = 375$.

$\vec{v} = \langle 7, -7\sqrt{3} \rangle$

$c = \sqrt{a^2+b^2}$ angle $\rightarrow$ $\tan\left(\frac{b}{a}\right)$ $\arctan\left(\frac{b}{a}\right)$ I or IV

$c = \sqrt{(7)^2+(-7\sqrt{3})^2}$ $\tan \frac{-7\sqrt{3}}{7}$ $\arctan\left(\frac{b}{a}\right)+180$ II or III

$c = \sqrt{49+49(3)}$ $\tan(-\sqrt{3})$ when $a+$, $bi-$ IV

$= \sqrt{196}$ $\arctan(-\sqrt{3}) = -60$ Since in IV

$= 14$ $360 - 60 = 300$

$\boxed{\arctan(-\sqrt{3}) = 300}$

$180-\theta$	θ
$\theta-180$	$360-\theta$

$\vec{v} = \langle 3, -2 \rangle$ $7 \cdot \vec{v} - 3 \cdot \vec{w}$

$\vec{w} = \langle -5, 6 \rangle$ $7\langle 3, -2 \rangle - 3\langle -5, 6 \rangle$

$\langle 21, -14 \rangle + \langle 15, -18 \rangle$

$\langle 36, -32 \rangle$

a) $-3-3i$

$r = \sqrt{(-3)^2+(-3)^2}$ $\tan\left(\frac{-3}{-3}\right)$ III

$\sqrt{9+9}$ $\tan(1) = 45+180$

$\sqrt{18} = 3\sqrt{2}$ $= 225$

$-3-3i = 3\sqrt{2}(\cos(225) + i\sin(225))$

$4(\cos(207) + i\sin(207)) \cdot 2(\cos(108) + i\sin(108))$

$8(\cos(207+108) + i\sin(207+108))$

$8(\cos(315) + i\sin(315))$

$8\left(\frac{\sqrt{2}}{2} + i\frac{\sqrt{2}}{2}\right)$

$\frac{8\sqrt{2}}{2} + i\frac{8\sqrt{2}}{2}$

$4\sqrt{2} + 4\sqrt{2}i$

$$\frac{9(\cos(190)+i\sin(190))}{15(\cos(70)+i\sin(70))}$$

$$\frac{9}{15}(\cos(190-70)+i\sin(190-70))$$

$$\frac{3}{5}(\cos 120+i\sin 120)$$

$$\frac{3}{5}\left(-\frac{1}{2}+i\frac{\sqrt{3}}{2}\right)$$

$$\frac{-3}{10}+i\frac{3\sqrt{3}}{10}$$

a) $(54, -18, 6, -2, \frac{2}{3})$

Geometric $r=-\frac{1}{3}$

$a_n = 54\cdot(-\frac{1}{3})^{n-1}$

c) 9, 5, 1, −3, −7

arthemetic $d=-4$

$a_n = 9+(n-1)4$

v.8 $a_{75} = -30+(75-1)8$

$d=8$ $a_{75} = -30+592$

$a_{75} = 622$

$S_n = \frac{P}{2}(a_1+a_P)$

$S_{75} = \frac{75}{2}(-30+622)$

$37.5(592)$

$S_{75} = 22200$

$$a_1\cdot\frac{(1-r^n)}{1-r}$$

v.9 $-7, -14, -28, -56, -112$

$r=2$

$$\sum_{n=1}^{8} a_n = -7\cdot\frac{(1-(2)^8)}{1-2}$$

$S_8 = -262$

v.10

$$\sum_{n=1}^{\infty} a_n \quad r=\frac{1}{4}$$

$$80\cdot\frac{1}{1-(\frac{1}{4})} = \frac{320}{3}$$