九十四學年四技二專第二次聯合模擬考試
共同考科　數學(B)卷　詳解

數學(B)卷 94-2-3

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
B	C	B	A	B	C	C	C	A	D	B	B	A	C	B	D	A	A	B	A	A	C	C	B	C

1. $f(x)=2(x-3)^2+5=2x^2-12x+23$
$\therefore a=-12$ ， $b=23$
$2a+b=-24+23=-1$

2. $\theta=\frac{\pi}{3}$
$A=\frac{1}{2}r^2\theta=\frac{1}{2}\cdot 6^2\cdot\frac{\pi}{3}=6\pi$

3. $a=0.456\boxed{4}56\cdots$
$b=0.456\boxed{5}65\cdots$
$c=0.456\boxed{6}66\cdots$ $\therefore c>b>a$

4. 設 $f(x)=(x-1)(x-2)Q(x)+(ax+b)$
$f(1)=a+b=-3$ $f(2)=2a+b=2$
$\therefore a=5$ ， $b=-8$
$\therefore r(x)=5x-8$ $\therefore r(-3)=-23$

5. 判別式 $D=(8k+1)^2-4\cdot 2k\cdot 8k>0$
$64k^2+16k+1-64k^2>0$
$16k>-1$ $\therefore k>-\frac{1}{16}$

6. $f(x)=6x^3-13x^2+4$
$f(x)=(x-2)(6x^2-x-2)$
$=(x-2)(2x+1)(3x-2)$
$\therefore b=1$ ， $c=-2$
$\therefore b+c=-1$

7. 令二根爲 α ， 2α
$\therefore \alpha+2\alpha=-p$ $\therefore p=-3\alpha$
$\alpha\cdot 2\alpha=q$ $\therefore q=2\alpha^2$ $\therefore 2p^2=9q$

8. 令所求直線方程式爲 $3x+2y=k$
$(2,2)$ 代入 $\therefore k=10$ $\therefore 3x+2y=10$

9. $2^{2x}+2^{x+2}-5=0$ $(2^x)^2+4\cdot 2^x-5=0$
$\therefore (2^x+5)(2^x-1)=0$
$\therefore 2^x=-5$ (不合) $2^x=1$ $\therefore x=0$
$\therefore a^2-3a+5=5$

10. 原式 $=\log_2 2^3-\log_3 3^{-3}+\log_5(5^3)^{\frac{1}{3}}$
$=3+3+1=7$

11. $\log(\frac{1}{5})^n<\log 10^{-6}$ $n\log\frac{2}{10}<-6$
$n(\log 2-\log 10)<-6$ $\therefore -0.6990n<-6$
$\therefore n>\frac{6}{0.6990}\fallingdotseq 8.58$ $\therefore n=9$

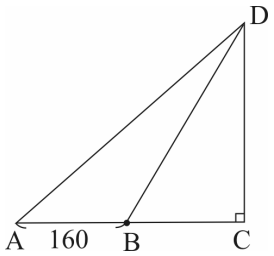
12. $(a^2b,a-b)\Rightarrow(-,+)$
$\therefore$第二象限

13. $\sum_{k=2}^{\infty}\frac{2^{k-1}+3^{k+1}}{5^k}=\sum_{k=2}^{\infty}\frac{2^{k-1}}{5^k}+\sum_{k=2}^{\infty}\frac{3^{k+1}}{5^k}$
$=\frac{1}{5}\sum_{k=2}^{\infty}(\frac{2}{5})^{k-1}+3\sum_{k=2}^{\infty}(\frac{3}{5})^k$
$=\frac{1}{5}\times\frac{\frac{2}{5}}{1-\frac{2}{5}}+3\times\frac{\frac{9}{25}}{1-\frac{3}{5}}=\frac{17}{6}$

14. 原式 $=\sin 210°+\cos 120°+\tan 315°+\sec 330°$
$=-\sin 30°-\cos 60°-\tan 45°+\sec 30°$
$=-\frac{1}{2}-\frac{1}{2}-1+\frac{2}{\sqrt{3}}=-2+\frac{2\sqrt{3}}{3}$

15. $\sin 200°$ 爲負
$1-\cos^2\theta>0$ ($\because -1<\cos\theta<1$)
$\therefore (\sin 200°,1-\cos^2\theta)\Rightarrow(-,+)$ 。在第二象限

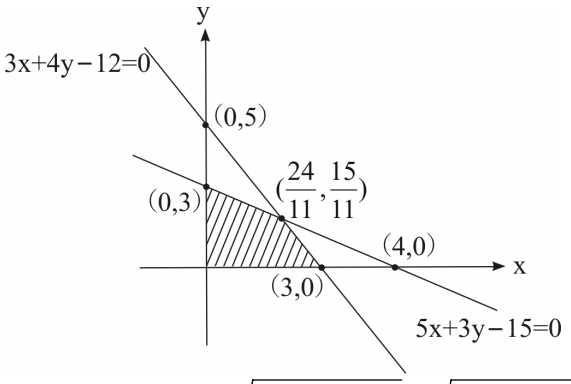
16. 令山高 $\overline{DC}=h$
$\therefore \overline{AC}=h$ $\therefore \overline{BC}=h-160$
$\therefore \tan 60°=\frac{h}{h-160}$ $\sqrt{3}=\frac{h}{h-160}$
$\sqrt{3}h-160\sqrt{3}=h$ $(\sqrt{3}-1)h=160\sqrt{3}$
$h=\frac{160\sqrt{3}}{\sqrt{3}-1}=\frac{160\sqrt{3}(\sqrt{3}+1)}{2}=240+80\sqrt{3}$



17. $\therefore \Delta ABC=\frac{1}{2}\cdot 8\cdot 12\cdot\sin 45°$
$=\frac{1}{2}\cdot 8\cdot 12\cdot\frac{\sqrt{2}}{2}=24\sqrt{2}$

18. $f(0,0)=-1$ $f(0,3)=-4$
$f(3,0)=5$ $f(\frac{24}{11},\frac{15}{11})=2$

$\therefore m=5$，$n=-4$　　$\therefore m+2n=-3$



19. 令圓心 o(a,0)　則 $\sqrt{(a-2)^2+4^2}=\sqrt{(a-7)^2+1^2}$

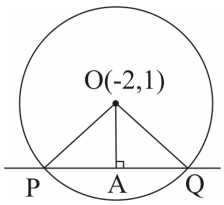
$\therefore a=3$　圓心 (3,0)　$r=\sqrt{(3-2)^2+4^2}=\sqrt{17}$

圓方程式 $(x-3)^2+y^2=17$　$x^2+y^2-6x-8=0$

20. $\overline{OA}=\dfrac{|-6-4|}{\sqrt{9+16}}=2$

$\overline{PA}=\sqrt{3^2-2^2}=\sqrt{5}$　　$\therefore \overline{PQ}=2\sqrt{5}$

ΔOPQ 面積 $=\dfrac{1}{2}\cdot 2\sqrt{5}\cdot 2=2\sqrt{5}$



21. $16+9-32+12-5=0$　　$\therefore (-4,3)$ 在圓上

$\therefore$過 $(-4,3)$ 且與圓相切的直線方程式爲

$-4x+3y+8\cdot\dfrac{-4+x}{2}+4\cdot\dfrac{3+y}{2}-5=0$　　$y=3$

22. $a_1+b_1=100$　　$99d=(a_{100}+b_{100})-(a_1+b_1)$

$99d=0$　　$\therefore d=0$

$\sum_{i=1}^{100}(a_i+b_i)=100(a_1+b_1)=100\times 100=10000$

23. $\begin{cases} a+ar^3=52 \\ ar+ar^2=40-52=-12 \end{cases}$

$\therefore \begin{cases} a(1+r)(1-r+r^2)=52\cdots(1) \\ ar(1+r)\qquad\qquad =-12\cdots(2) \end{cases}$

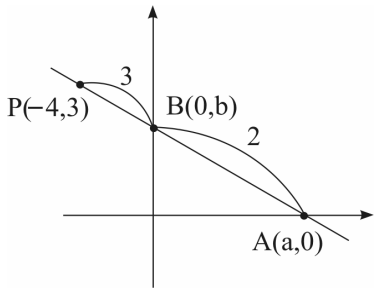
$\dfrac{(1)}{(2)}$　　$\dfrac{1-r+r^2}{r}=-\dfrac{13}{3}$

$3r^2+10r+3=0$　　$(r+3)(3r+1)=0$

$r=-3$，$-\dfrac{1}{3}$

24. $\because \overline{AP}:\overline{PB}=5:3$　　$\therefore \overline{PB}:\overline{BA}=3:2$

$\dfrac{3a-8}{3+2}=0$　　$a=\dfrac{8}{3}$　　$\dfrac{0+6}{3+2}=b$　　$b=\dfrac{6}{5}$



方程式 $\dfrac{x}{\frac{8}{3}}+\dfrac{y}{\frac{6}{5}}=1$　　$\therefore 9x+20y-24=0$

25. $6x-12+4x+2>0$

$10x>10$，$x>1$