補充答題紙 Supplementary answer sheet (A)

香港考試局
HONG KONG EXAMINATIONS AUTHORITY

考生編號 Candidate Number

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題解

A(1)

1. $3x-y=2(x+2y)$

$x=5y$

$\frac{x}{y}=5$

$x:y=5:1$ #

2. $\cos\theta=\frac{\sqrt{3}}{2}$

$\theta=30°$ #

$\sin 30°\tan 30°=\frac{1}{2}\times\frac{1}{\sqrt{3}}$

$=\frac{1}{2\sqrt{3}}$

$=\frac{\sqrt{3}}{2(\sqrt{3})^2}$

$=\frac{\sqrt{3}}{6}$ #

3. $a(3b-1)=2b+1$

$3ab-2b=a+1$

$b(3a-2)=a+1$

$b=\frac{a+1}{3a-2}$ #

4. $\tan 35°=\frac{x}{2}$

$x=2\tan 35°$

$=1.4$ #

$\sin 54°=\frac{x}{y}$

$y=\frac{1.4}{\sin 54°}$

$=0.809$ #

4. $(3^{x+1})(3^{x-1})=3^3$

$3^{x+1+x-1}=3^3$

$2x=3$

$x=1.5$ #

6. (a) $\alpha+\beta=\frac{-(-5)}{2}=2.5$ #

$\alpha\beta=\frac{1}{2}$ #

(b) $\alpha^2+\beta^2=(\alpha+\beta)^2-2\alpha\beta$

$=(2.5)^2-2(\frac{1}{2})$

$=\frac{21}{4}$ #

7. (a) $\cos\angle AOC=\frac{12}{20}$

$\angle AOC=53.13°$ #

(b) 陰影面積

= 扇形面積 − △OAC 面積

$=\frac{1}{2}(20)^2(\frac{53.13°}{180°}\pi)-\frac{1}{2}(20)(12)\sin 53.13°$

$=89.46$ #

8 代 $x=0$ 入 $y=-x^2+5x+6$

$y=6$

$\therefore A=(0,6)$ #

代 $y=6$ 入 $y=-x^2+5x+6$

$6=-x^2+5x+6$

$x=0$ 或 5

$\therefore B=(5,6)$ #

$C=(5,0)$ #

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9. (a) $f(2) = a(2)^2 - 4(2) + b$

$0 = 4a - 8 + b$ — (1)

$f(-1) = a(-1)^2 - 4(-1) + b$

$3 = a + 4 + b$ — (2)

解 (1) 及 (2)

$a = 3$, $b = -4$ #

(b) $f(x) = 3x^2 - 4x - 4$

$f(0) = 3(0)^2 - 4(0) - 4$

餘數 $= -4$ #

A(2)

10. (a) $\begin{cases} x + 2y = 8 & -(1) \\ 3x - y = 3 & -(2) \end{cases}$

由 (1) $x = 8 - 2y$ — (3)

代 (3) 入 (2)

$3(8 - 2y) - y = 3$

$y = 3$

$x = 2$ #

(b) 由 (a) $\frac{p}{8} = 2$; $\frac{p}{8} = 3$

$\therefore \frac{p}{2} = \frac{8}{1}$; $\frac{p}{3} = \frac{8}{1}$

$\therefore p : q = 2 : 1$ 及

$p : r = 3 : 1$

$p : q : r = 6 : 3 : 2$ #

11. (a) 所需概率 $= \frac{7}{10} \times \frac{3}{8} = \frac{21}{80}$ #

(b) 所需概率 $= \frac{7}{10}\left(\frac{5}{8}\right) + \frac{3}{10}\left(\frac{3}{8}\right)$

$= \frac{11}{20}$ #

(c) 所需概率 $= \frac{21}{80} + \frac{11}{20}$

$= \frac{13}{16}$ #

12. (a) $y = k_1 x^2$

$z = \frac{k_2}{x}$

$\therefore A = k_1 x^2 + \frac{k_2}{x}$

$(-1) = k_1 (1)^2 + \frac{k_2}{(1)}$

$-1 = k_1 + k_2$ — (1)

$(3) = k_1 (2)^2 + \frac{k_2}{2}$

$3 = 4k_1 + \frac{k_2}{2}$

$6 = 8k_1 + k_2$ — (2)

解 (1) 及 (2)

$k_1 = 1$; $k_2 = -2$

$\therefore A = x^2 - \frac{2}{x}$ #

(b) $A = (4)^2 - \frac{2}{4}$

$= 15.5$ #

13 (a) 平均數 $= 52.04$

眾數 $= 65$

中位數 $= 57$

標準差 $= 27$

(b) 數學標準分 $= \frac{80 - 52.04}{27} = 1.036$

英文標準分 $= \frac{80 - 60}{20} = 1$

$\therefore$ 數學標準分較高

$\therefore$ 數學科表現較好。#

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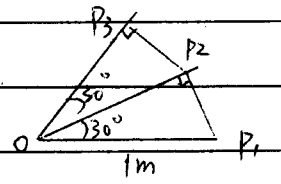


(a) $P_1P_2 = \sin 30^\circ = \frac{1}{2}$

$P_2P_3 = OP_2 \sin 30^\circ$

$= \cos 30^\circ \cdot \sin 30^\circ$

$= (\frac{\sqrt{3}}{2})(\frac{1}{2})$

$= \frac{\sqrt{3}}{4}$ m #

(b) $P_1P_2 = \frac{1}{2}$

$P_2P_3 = \frac{\sqrt{3}}{4}$

$\therefore A = \frac{1}{2}$; $R = \frac{\sqrt{3}}{2}$

$P_nP_{n+1} = \frac{1}{2}(\frac{\sqrt{3}}{2})^{n-1}$

$= \frac{(\sqrt{3})^{n-1}}{2^n}$ m #

(c) Total distance 距離

$= P_1P_2 + P_2P_3 + P_3P_4 + \cdots$

$= \frac{\frac{1}{2}}{1-\frac{\sqrt{3}}{2}}$

$= \frac{1}{2-\sqrt{3}}$ m #

B

15(a) $\begin{cases} x^2+y^2-4x+8y=0 & -(1) \\ x+3y+20=0 & -(2) \end{cases}$

代(2)入(1)

$(-3y-20)^2+y^2-4(-3y-20)+8y=0$

$9y^2+120y+400+y^2+12y+80+8y=0$

$10y^2+140y+480=0$

$\begin{cases} y=-6 \text{ 或 } -8 \\ x=-2 \quad 4 \end{cases}$

$\therefore P=(-2,-6)$; $Q=(4,-8)$ #

15(b) $PQ = \sqrt{(-2-4)^2+(-6-(-8))^2}$

$= \sqrt{40}$

$= 2\sqrt{10}$ #

(c)(i) S 半徑 $= \sqrt{(-\frac{-4}{2})^2+(\frac{8}{2})^2}$

$= 2\sqrt{5}$

$\therefore PQ^2 = AP^2 + AQ^2 - 2(AP)(AQ)\cos\angle PAQ$

$(\sqrt{40})^2 = (2\sqrt{5})^2+(2\sqrt{5})^2-2(2\sqrt{5})(2\sqrt{5})\cos\angle PAQ$

$40 = 40 - 40\cos\angle PAQ$

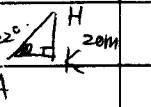
$\cos\angle PAQ = 0$

$\angle PAQ = 90^\circ$ #

(ii) $\angle PAQ = 2 \times \angle POQ$ (圓心角2倍於圓周角)

$\angle POQ = 45^\circ$ #

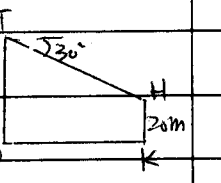
16.(a) $AK = \frac{20}{\tan 22^\circ} = 49.5$



$\frac{AK}{\sin 40^\circ} = \frac{OK}{\sin 60^\circ}$

$OK = \frac{49.5}{\sin 40^\circ}\sin 60^\circ = 66.69$ m #

(b)



OT

$= 20 + OK\tan 30^\circ$

$= 58.5$ m #

(c) $OA^2 = AK^2 + OK^2 - 2(AK)(OK)\cos 80^\circ$

$= (49.5)^2+(66.69)^2-2(49.5)(66.69)\cos 80^\circ$

$OA = 75.84$

仰角 $= \tan^{-1}(\frac{OT}{OA})$

$= 37.65^\circ$ #

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17.

(a) $\angle CAB = \angle BCD$ (

$\angle DAB = \angle BDC$ (

$\therefore \angle CBD + \angle CAD = \angle CBD + \angle BCD + \angle BDC$

$= 180°$ # (△內角和).

(b) $\because \angle FAE + \angle FBE = 180°$

$\therefore$ A, E, B, F 為圓內接四邊形 #

(c) $\angle DAF = \angle BDE$ (共角)

$\angle AFD = \angle BED$ (圓內接四邊形外角)

$\therefore \triangle DAF \sim \triangle DBE$ (A.A.A.) #

(d) 設 $BF = x$

$\frac{2}{5} = \frac{x+2}{1}$ $\frac{2}{5} = \frac{1}{x+2}$

$x = \frac{3}{5}$ $2x + 4 = 5$

$x = \frac{1}{2}$ #