2008- CE
MATH
PAPER 2

MC

遵理學校
BEACON COLLEGE

HONG KONG CERTIFICATE OF EDUCATION MOCK EXAMINATION 2008

MATHEMATICS PAPER 2

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Time Allowed : $1\frac{1}{2}$ hour

1. Read carefully the instructions on the Answer Sheet and insert the information required (including the Subject Code) in the spaces provided.

2. When told to open this book, you should check that all the questions are there. Look for the words '**END OF PAPER**' after the last question.

3. All questions carry equal marks.

4. **ANSWER ALL QUESTIONS**. You should mark all your answers on the Answer Sheet.

5. You should mark only **ONE** answer for each question. If you mark more than one answer, you will receive **NO MARKS** for that question.

6. No marks will be deducted for wrong answers.

FORMULAS FOR REFERENCE
參考公式

SPHERE	Surface area	$= 4\pi r^2$
球體	表面積	$= 4\pi r^2$
	Volume	$= \frac{4}{3}\pi r^3$
	體積	$= \frac{4}{3}\pi r^3$
CYLINDER	Area of curved surface	$= 2\pi rh$
圓柱	側面積	$= 2\pi rh$
	Volume	$= \pi r^2 h$
	體積	$= \pi r^2 h$
CONE	Area of curved surface	$= \pi rl$
圓錐	側面積	$= \pi rl$
	Volume	$= \frac{1}{3}\pi r^2 h$
	體積	$= \frac{1}{3}\pi r^2 h$
PRISM	Volume	=base area × height
角柱	體積	=底面積 × 高
PYRAMID	Volume	$= \frac{1}{3} \times$ base area × height
角錐	體積	$= \frac{1}{3} \times$ 底面積 × 高

There are 36 questions in Section A and 18 questions in Section B.
甲部共 36 題，乙部共 18 題。
The diagrams in this paper are not necessarily drawn to scale.
本試卷的附圖不一定依比例繪成。
Choose the best answer for each question.
選出每題最佳的答案。

Section A
甲部

1. If $a=\dfrac{2b(2y-x)}{x-3y}$, then $y=$
若 $a=\dfrac{2b(2y-x)}{x-3y}$，則 $y=$

A. $\dfrac{a+2b}{3a+4b}x$
B. $\dfrac{a-2b}{-3a+4b}x$
C. $-\dfrac{a+2b}{3a+4b}x$
D. $\dfrac{3a+4b}{a+2b}x$

2. $\left(3^4\right)^m\cdot\left(3^n\right)^2=$

A. 3^{4m+2n}
B. $3^{4m}+3^{2n}$
C. 3^{8mn}
D. $3^{4^m+2^n}$

3. If $f(x)=2x^2+4x+3$, then $f(x+1)-f(x)=$
若 $f(x)=2x^2+4x+3$，則 $f(x+1)-f(x)=$

A. $2x^2+8x+9$
B. x^2+2x+1
C. $2x+3$
D. $4x+6$

4. If $x^2 + y^2 = 5$ and $x + y = 3$, then $x - y =$
若 $x^2 + y^2 = 5$ 和 $x + y = 3$ ，則 $x - y =$

A. 1
B. -1
C. 1 or -1
1 或 -1
D. 1 or -5
1 或 -5

5. Solve $-1 < \dfrac{5-2x}{3} < 2x + 15$.
解 $-1 < \dfrac{5-2x}{3} < 2x + 15$ 。

A. $-5 < x < 4$
B. $-4 < x < 5$
C. $x < -5$ or $x > 4$
$x < -5$ 或 $x > 4$
D. $x < 4$

6. Peter is driving at x km/h from city A to city B. The distance between city A and city B is 1000 km. It will save him 3 hours in travelling time if he drives 5 km/h faster. Which of the following equations gives the value of x?
彼得從城市A以x km/h的時速駕駛至城市B。城市A與城市B的距離爲 1000 km。若他將時速增加 5 km/h ，則他會節省 3 小時。下列哪一條方程可求出x的值？

A. $\dfrac{1000}{x+5} = 3$
B. $\dfrac{1000}{x+5} - \dfrac{1000}{x} = 3$
C. $\dfrac{1000}{x} - \dfrac{1000}{x+5} = 3$
D. $\dfrac{1000}{x} - \dfrac{1000}{x-5} = 3$

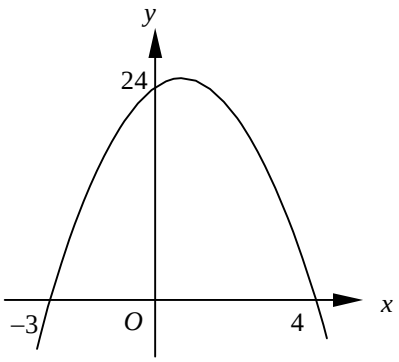
7. If $P(x+2) + Q(5-x) \equiv x - 12$, find the values of P and Q.
若 $P(x+2) + Q(5-x) \equiv x - 12$ ，求 P 及 Q 的值。

A. $P = 1$, $Q = 2$
B. $P = -1$, $Q = 2$
C. $P = 2$, $Q = -1$
D. $P = -1$, $Q = -2$

8. The equation $x^2 + kx + k = 0$ has equal roots, k =
方程 $x^2 + kx + k = 0$ 有等根，k =

A. 4 only
只有 4
B. −4 only
只有 −4
C. 0 or 4
D. 0 or −4

9. Which of the following may represent the graph in the figure?
下列何者可以代表圖中的圖像？



A. $y = (x + 3)(x - 4)$
B. $y = (x - 3)(x + 4)$
C. $y = -(x + 3)(x - 4)$
D. $y = -2(x + 3)(x - 4)$

10. If $\frac{1}{a} : \frac{1}{b} = 1 : 2$ and $b : c = 2 : 5$, then $\frac{1}{a} : \frac{1}{c}$ =
若 $\frac{1}{a} : \frac{1}{b} = 1 : 2$ 及 $b : c = 2 : 5$，則 $\frac{1}{a} : \frac{1}{c}$ =

A. 5 : 4
B. 4 : 1
C. 4 : 5
D. 5 : 1

11. The depth of a swimming pool is 1 m, correct to the nearest 10 cm. The percentage error is
某個游泳池的深度是 1 m，準確至最接近的 10 cm，百分誤差是

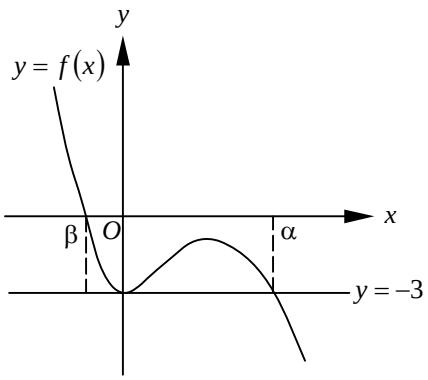
A. 0.1%
B. 0.5%
C. 1%
D. 5%

12. $10000 is invested for 2 years at 10% per annum, compounded half-yearly. The compound interest, correct to nearest dollar, is
若將$10000 以年利率 10%投資兩年，而利息按半年計算，則複利息爲（準確至最接近的元）

A. $2000
B. $2100
C. $2155
D. $12155

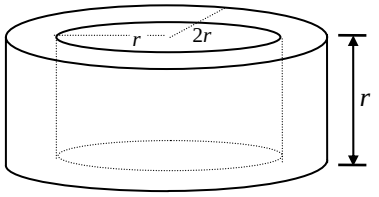
13. The figure shows the graphs of $y = f(x)$ and $y = -3$. The solution of $3 + f(x) \geq 0$ is
圖中所示爲 $y = f(x)$及 $y = -3$ 的圖像。$3 + f(x) \geq 0$ 的解爲

A. $x \geq \alpha$
B. $x \leq \alpha$
C. $x \geq \beta$
D. $x \leq \beta$



14. A cylindrical hole of radius r is drilled through a solid cylinder, base radius $2r$ and height r, as shown in the figure. The percentage increase in the total surface area is
如下圖，一底部半徑爲 $2r$ 及高度爲 r 的實心圓柱體被鑽出一個半徑爲 r 的圓柱形的洞。總表面面積的增加百分比爲

A. 0%
B. $16\frac{2}{3}\%$
C. 20%
D. 25%



15. Solve $\begin{cases} \frac{2}{x} - 3y = 7 \\ \frac{3}{x} + 2y = 4 \end{cases}$.

解 $\begin{cases} \frac{2}{x} - 3y = 7 \\ \frac{3}{x} + 2y = 4 \end{cases}$。

A. $x = \frac{5}{2},\ y = \frac{7}{5}$

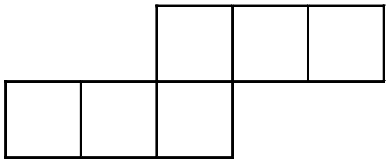
B. $x = \frac{1}{2},\ y = -1$

C. $x = \frac{13}{11},\ y = -\frac{23}{13}$

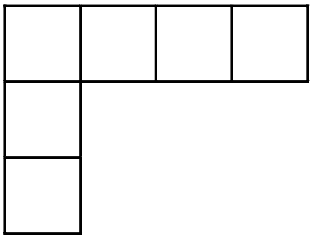
D. $x = \frac{4}{13},\ y = -\frac{1}{6}$

16. Which of the following nets cannot be used to fold a cube?
下列哪一個摺紙圖樣不能摺成正方體？

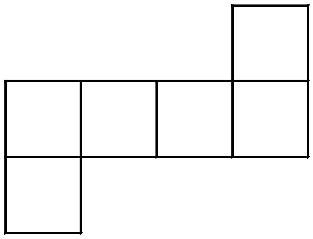
A.



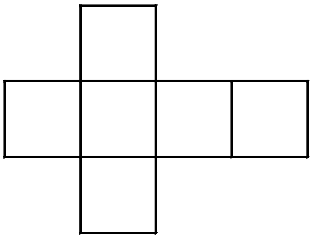
B.



C.



D.



17. The polar coordinates of a point $A(2, 30°)$ is rotated through 270° anti-clockwise about the pole O and reflected in the y-axis. The polar coordinates of the final image are
某點 A 的極坐標爲 $(2, 30°)$，它被繞 O 逆時針旋轉 270°並沿 y 軸反射。A 的影像的極坐標爲

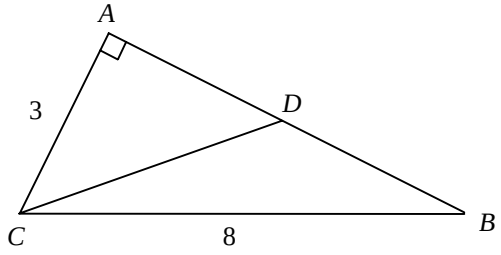
A. $(2, 60°)$
B. $(2, 120°)$
C. $(2, 240°)$
D. $(2, 300°)$

18. Which of the following best describe the locus of a point P moving in such a way that it is equidistant from two fixed points A and B?
下列哪個爲一與兩不動點 A 及 B 等距的動點 P 的軌跡的最合適描述？

A. It is a line parallel to AB.
它是一條與 AB 平行的直線。
B. It is a line perpendicular to AB.
它是一條與 AB 垂直的直線。
C. It is a circle with centre at P.
它是一個以 P 爲圓心的圓。
D. It is the perpendicular bisector of AB.
它是 AB 的垂直平分線。

19. In ΔABC, $\angle A = 90°$, $AC = 3$, $BC = 8$. Find the length of the median CD.
在 ΔABC 中，$\angle A = 90°$，$AC = 3$，$BC = 8$。求中線 CD 的長度。

A. $\frac{\sqrt{91}}{2}$
B. $\frac{\sqrt{91}}{4}$
C. $\sqrt{91}$
D. 6



20. In the figure, $AD \perp BC$. Find $\frac{x}{y}$.

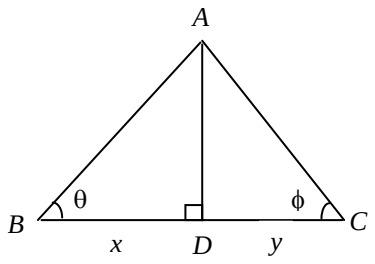
圖中，$AD \perp BC$ 。求 $\frac{x}{y}$ 。

A. $\frac{\sin\phi}{\sin\theta}$

B. $\frac{\cos\phi}{\cos\theta}$

C. $\frac{\tan\phi}{\tan\theta}$

D. $\frac{\cos\theta}{\cos\phi}$



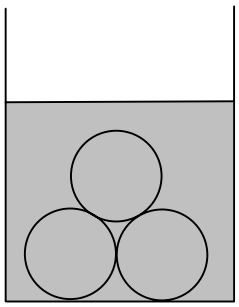
21. A measuring cylinder of base radius 2 cm contains water. Three balls each of radius 1 cm, are put into the cylinder, as shown in the figure. What is the rise in the water level?
一圓柱體量杯裝有水而底半徑爲 2 cm。三個半徑爲 1 cm 的圓球體被放進量杯中，如圖所示。水面升高了多少？

A. $\frac{1}{2}$ cm

B. 1 cm

C. 2 cm

D. π cm



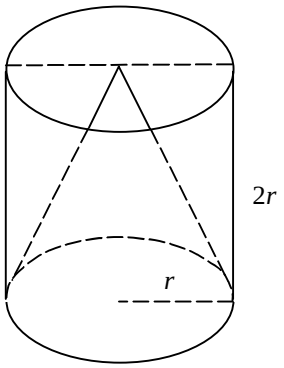
22. A cone of base radius r and height $2r$ is placed inside a cylindrical container of base radius r and height $2r$, as shown in the figure. Find the ratio $\frac{\text{Curved surface area of the cone}}{\text{Curved surface area of the cylinder}}$.
如圖所示，一底半徑爲 r 而高爲 $2r$ 的圓錐體被放進一底半徑爲 r 而高爲 $2r$ 的圓柱體容器。求比例 $\frac{\text{圓錐體曲面面積}}{\text{圓柱體曲面面積}}$ 。

A. $\frac{3}{4}$

B. $\frac{1}{2}$

C. $\frac{\sqrt{5}}{2}$

D. $\frac{\sqrt{5}}{4}$



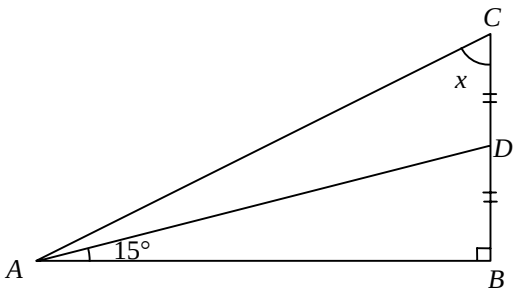
23. For $0° \le x \le 90°$, the maximum value of $\dfrac{3}{4+2\cos x}$ is

對於$0° \le x \le 90°$，$\dfrac{3}{4+2\cos x}$的極大值爲

A. $\dfrac{1}{2}$
B. $\dfrac{3}{4}$
C. $\dfrac{3}{2}$
D. 3

24. In the figure, find x correct to the nearest degree.
圖中，求 x 準確至最接近的度。

A. 35°
B. 59°
C. 60°
D. 62°

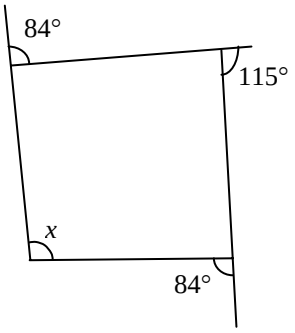


25. A pilot flies for 120 km on a bearing of 072°, from *O* to *A*. He then turns right through 90° and flies through 270 km to *B*. Calculate the bearing of *O* from *B*. (correct the answer to the nearest degree.)
一機師由 *O* 沿 072° 飛行了 120 km 到達 *A*。及後右轉 90° 並飛行 270 km 到達 *B*。計算由 *B* 測 *O* 之方位角。(準確至最接近的度數。)

A. 262°
B. 278°
C. 288°
D. 318°

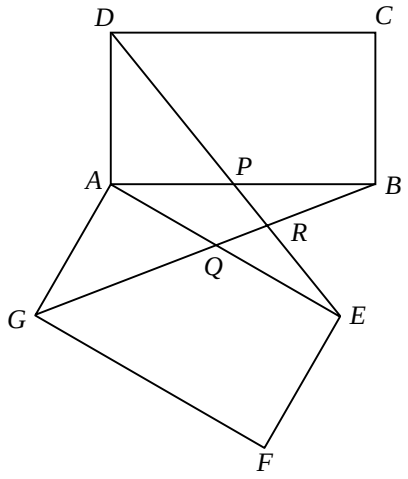
26. In the figure, x =
在圖中，x =

A. 77°
B. 84°
C. 96°
D. 103°



27. In the figure, *ABCD* and *AEFG* are two identical rectangles. Which of the following is/are true?
圖中，*ABCD* 及 *AEFG* 爲兩全等長方形。下列何者爲正確？

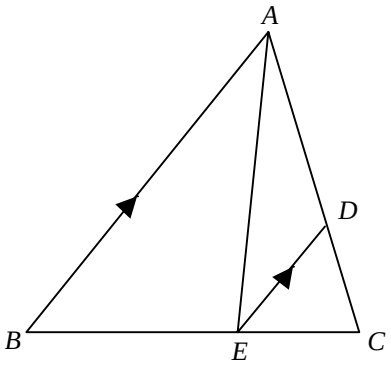
I. $\Delta BRP \cong \Delta ERQ$
II. $\Delta APE \cong \Delta AQB$
III. $\Delta ADE \cong \Delta AGB$



A. I only
只有 I
B. III only
只有 III
C. I and II only
只有 I 及 II
D. I, II and III
I、II 及 III

28. In the figure, $AB // DE$ and $AD : DC = 4 : 1$. If the area of ΔADE is 6, then the area of ΔABE is
圖中，$AB // DE$ 及 $AD : DC = 4 : 1$。若 ΔADE 的面積爲 6，則 ΔABE 的面積是

A. 12.
B. 24.
C. 30.
D. 96



29. The equation of the perpendicular bisector of the line joining *A*(1, 2) and *B*(7, 4) is
A(1, 2) 和 *B*(7, 4) 的垂直平分線方程爲

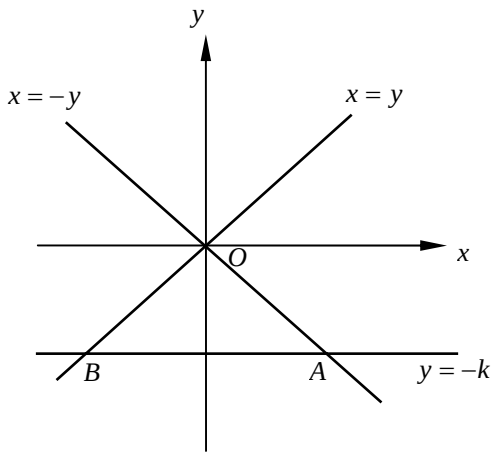
A. $3x + y + 15 = 0$
B. $3x + y - 15 = 0$
C. $3x - y + 9 = 0$
D. $3x - y - 9 = 0$

30. The distance between $(1 - k, k)$ and $(2, 1 + k)$ is $\sqrt{26}$, k =
$(1 - k, k)$ 與 $(2, 1 + k)$ 之間的距離爲 $\sqrt{26}$ ，k =

A. 4
B. 6
C. – 4 or 6
– 4 或 6
D. 4 or – 6
4 或 – 6

31. In the figure, three straight lines $x = y$, $x = –y$ and $y = –k$ form a triangle OAB. If the area of the triangle is 8, then k =
圖中，三條直線 $x = y$，$x = –y$ 和 $y = –k$ 形成三角形 OAB。若該三角形的面積爲 8，則 k =

A. $-\sqrt{8}$
B. $\sqrt{8}$
C. –4
D. 4



32. Two dice are thrown. The probability of getting a sum less than 8 and greater than 5 is
投擲兩枚骰子。所得的和少於 8 及大於 5 之概率爲

A. $\frac{11}{36}$
B. $\frac{1}{3}$
C. $\frac{2}{9}$
D. $\frac{5}{36}$

33. 4 balls marked numbers 1, 2, 5, 10. Draw two balls. Find the probability of the sum greater than or equal to 7.
有四個號碼分別爲 1、2、5、10 的球並從中抽出兩球。求該和大於或等於 7 的概率。

A. $\frac{1}{2}$
B. $\frac{5}{8}$
C. $\frac{2}{3}$
D. $\frac{3}{4}$

34. If the mean of two positive numbers a and b is 1, then $10^a \cdot 10^b =$
若兩正數 a 和 b 的平均數爲 1，則$10^a \cdot 10^b =$

A. 100
B. 10
C. 1
D. $\frac{1}{2}$

35.

Class mark 組標	Frequency 頻數
$m-8$	3
$m-4$	1
m	2
$m+4$	6

Find the mean.
求平均數。

A. $m-\frac{1}{3}$
B. $m-\frac{1}{2}$
C. $m-2$
D. $m-4$

36. If a, b and c are the 1st, 2nd and 3rd quartiles of a distribution respectively, which of the following is/are true?
若 a、 b 和 c 分別爲某分佈之第一、第二和第三四份位數，下列哪一項是正確的?

I. $b = \frac{a+c}{2}$.

II. b is the median of the distribution.
b 爲該分佈之中位數。

III. b is the mode of the distribution.
b 爲該分佈之眾數。

A. I only
只有 I

B. II only
只有 II

C. III only
只有 III

D. I, II only
只有 I 和 II

Section B
乙部

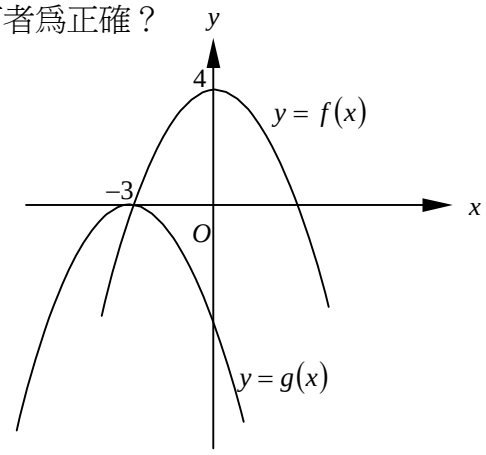
37. If $x = \log(ab)$ and $y = \log a$, then $b =$
若 $x = \log(ab)$ 及 $y = \log a$ ，則 $b =$

A. $\frac{x}{y}$
B. $10^{\frac{x}{y}}$
C. $x - y$
D. 10^{x-y}

38. If $x + 2$ is a factor of $x^2 + ax + b$, then $2a - b + 3 =$
若 $x + 2$ 爲 $x^2 + ax + b$ 的因子, 則 $2a - b + 3 =$

A. –7
B. –1
C. 1
D. 7

39. In the figure, the graph of $y = g(x)$ is obtained by translating the graph of $y = f(x)$. Which of the following is true?
圖中， $y = g(x)$ 是由平移 $y = f(x)$所得。下列何者爲正確？



A. $g(x) = f(x+3)+4$
B. $g(x) = f(x+3)-4$
C. $g(x) = f(x-3)+4$
D. $g(x) = f(x-3)-4$

40. For $0 \le \theta \le 360°$ the number of roots of the equation $\tan\theta - 3\sin\theta = 0$ is
在 $0 \le \theta \le 360°$ 間，方程 $\tan\theta - 3\sin\theta = 0$ 的根的數目是

A. 2
B. 3
C. 4
D. 5

41. $\dfrac{1+\sin\theta}{\cos(360°-\theta)}-\dfrac{\sin(270°-\theta)}{1-\sin(180°+\theta)}=$

A. $2\tan\theta$
B. 1
C. $\dfrac{2}{\cos\theta}$
D. $\dfrac{1+\sin\theta-\cos\theta}{\cos\theta(1+\sin\theta)}$

42. $\dfrac{1}{\dfrac{1}{\cos\theta}-1}-\dfrac{1}{\dfrac{1}{\cos\theta}+1}=$

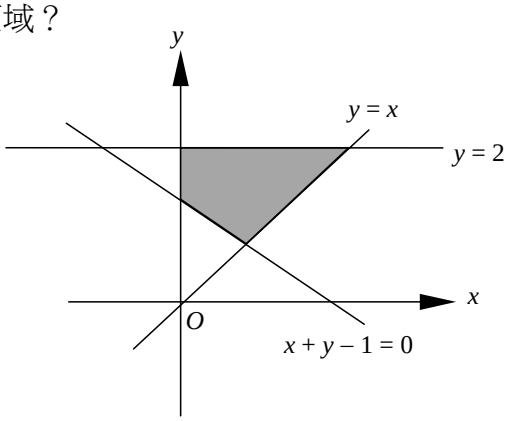
A. $\dfrac{2}{\tan^2\theta}$
B. $\dfrac{2}{\tan\theta}$
C. $2\tan^2\theta$
D. $\dfrac{2\cos\theta}{\sin^2\theta}$

43. Solve $\begin{cases} xy+\dfrac{4}{xy}+4=0 \\ x+y=1 \end{cases}$.

解$\begin{cases} xy+\dfrac{4}{xy}+4=0 \\ x+y=1 \end{cases}$。

A. $\begin{cases} x=1 \\ y=-2 \end{cases}$
B. $\begin{cases} x=-2 \\ y=1 \end{cases}$
C. $\begin{cases} x=1 \\ y=-2 \end{cases}$ or $\begin{cases} x=-2 \\ y=1 \end{cases}$
$\begin{cases} x=1 \\ y=-2 \end{cases}$或$\begin{cases} x=-2 \\ y=1 \end{cases}$
D. $\begin{cases} x=-1 \\ y=2 \end{cases}$ or $\begin{cases} x=2 \\ y=-1 \end{cases}$
$\begin{cases} x=-1 \\ y=2 \end{cases}$或$\begin{cases} x=2 \\ y=-1 \end{cases}$

44. Which of the following systems of inequalities represent the shaded region in the figure?
下列哪一組不等式代表圖中之陰影區域？



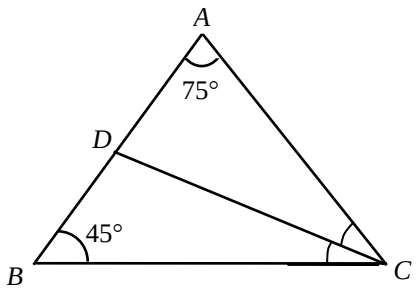
A. $\begin{cases} y \geq 2 \\ x + y \geq 1 \\ y \geq x \end{cases}$

B. $\begin{cases} y \leq 2 \\ x + y \geq 1 \\ y \geq x \end{cases}$

C. $\begin{cases} y \leq 2 \\ x + y \leq 1 \\ y \geq x \end{cases}$

D. $\begin{cases} y \leq 2 \\ x + y \geq 1 \\ y \geq x \\ x \geq 0 \end{cases}$

45. In the figure, CD bisects $\angle ACB$. $\dfrac{BD}{CD} =$
在圖中，CD 平分 $\angle ACB$。$\dfrac{BD}{CD} =$



A. $\dfrac{2}{3}$

B. $\dfrac{1}{\sqrt{2}}$

C. $\sqrt{2}$

D. $\sqrt{\dfrac{2}{3}}$

46. The sum of the first ten terms of an arithmetic sequence is 120. If the common difference is 4, then the first term is
一等差數列的首十項的和爲 120。若公差爲 4，則首項是

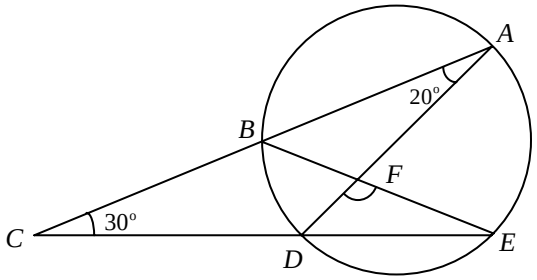
A. −12
B. −6
C. −2
D. 2

47. If $a \neq \pm 1$, then $1 + a^2 + a^4 + \cdots + a^{2n} =$
若 $a \neq \pm 1$，則 $1 + a^2 + a^4 + \cdots + a^{2n} =$

A. $\dfrac{1 - a^{2n}}{1 - a}$
B. $\dfrac{1 - a^{2n+2}}{1 - a^2}$
C. $\dfrac{1 - a^{2n+1}}{1 - a}$
D. $\dfrac{1 - a^{2n+1}}{1 - a^2}$

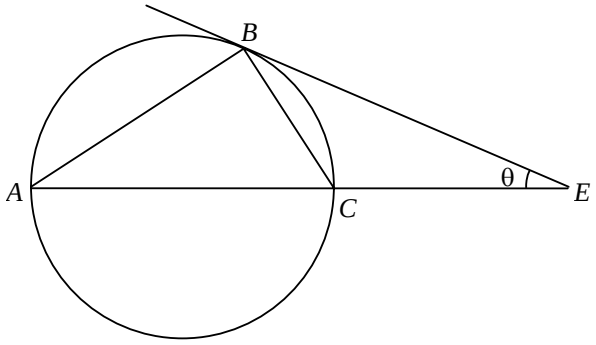
48. In the figure, *ABC*, *BFE*, *AFD* and *CDE* are straight lines. $\angle ACE = 30^\circ$ and $\angle CAD = 20^\circ$. Then $\angle DFE =$
圖中，*ABC*、*BFE*、 *AFD* 和 *CDE* 爲直線。$\angle ACE = 30^\circ$ 和 $\angle CAD = 20^\circ$。
則 $\angle DFE =$

A. 50°
B. 60°
C. 90°
D. 110°



49. In the figure, *BE* is a tangent to the circle *ABC* at *B* and *AC* is a diameter. If $\angle BEC = \theta$, find $\angle BAC$ in terms of θ.
圖中，直線 *BE* 與圓 *ABC* 相切於 *B* 而 *AC* 爲一直徑。若 $\angle BEC = \theta$，以 θ 表 $\angle BAC$。

A. $90^\circ - \theta$
B. $90^\circ - \dfrac{\theta}{2}$
C. $45^\circ + \dfrac{\theta}{2}$
D. $45^\circ - \dfrac{\theta}{2}$



50. The equation of a circle is $2x^2 + 2y^2 - 4x + 6y + 3 = 0$. Which of the following is/are true?
圓的方程爲 $2x^2 + 2y^2 - 4x + 6y + 3 = 0$。下列何者是正確的？

I. The centre of the circle is in the fourth quadrant.
圓的圓心位於第四象限。

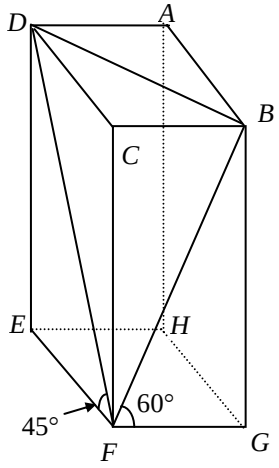
II. The area of the circle is $\frac{7\pi}{4}$.
圓的面積是 $\frac{7\pi}{4}$。

III. The circle meets the x-axis at two distinct points.
圓與 x 軸相交於兩相異點。

A. I only
只有 I
B. II only
只有 II
C. I and II only
只有 I 及 II
D. I, II and III
I、II 及 III

51. In the figure, $ABCDEFGH$ is a cuboid, $\angle DFE = 45^\circ$, and $\angle BFG = 60^\circ$. Find $\cos\angle BFD$.
圖中，$ABCDEFGH$ 爲正長方體，$\angle DFE = 45^\circ$ 和 $\angle BFG = 60^\circ$。求 $\cos\angle BFD$。

A. $\frac{\sqrt{3}}{6}$
B. $\frac{\sqrt{2}}{6}$
C. $\frac{\sqrt{6}}{3}$
D. $\frac{\sqrt{6}}{4}$



52. A bag contains 4 red, 3 green and 2 white balls. Three men A, B, C each draw a ball in turn from the bag at random without replacement. If A draws first, B second and C third, what is the probability that only B and C can draw white ball ?
一袋內有 4 個紅色、3 個綠色和 2 個白色的球。三人 A、B、C 各輪流隨意抽出一球，而抽出的球並不會放回袋裡。若 A、B、C 順序抽出一球，問只有 B 和 C 抽得白球的概率爲多少 ？

A. $\frac{1}{36}$
B. $\frac{1}{28}$
C. $\frac{4}{81}$
D. $\frac{25}{72}$

53. Given $a + 1$, $a + 2$, $a + 3$ and $b + 1$, $b + 2$, $b + 3$ are two groups of numbers. m_1 and m_2 are respectively the means of the two groups of numbers while s_1 and s_2 are respectively their standard deviations, where $a > b$.
已知兩組數爲 $a + 1$, $a + 2$, $a + 3$ 和 $b + 1$, $b + 2$, $b + 3$ 。m_1 和 m_2 分別爲兩組的平均數，而 s_1 和 s_2 分別爲兩組的標準差，其中 $a > b$。
Which of the following is true?
下列哪一項是真確的？

A. $m_1 > m_2$ and $s_1 > s_2$
B. $m_1 > m_2$ and $s_1 = s_2$
C. $m_1 = m_2$ and $s_1 > s_2$
D. $m_1 = m_2$ and $s_1 = s_2$

54. Which of the following is NOT is a property of the graph of $y = \log_a x$, where $0 < a < 1$?
下列哪一項不是 $y = \log_a x$ 的圖像的性質，其中 $0 < a < 1$ ？

A. The x-intercept of the graph is 1.
圖像的 x 軸截距是 1。
B. The graph lies on the right hand side of the y-axis.
圖像位於 y 軸的右側。
C. The graph is decreasing.
圖像是遞減的。
D. The graph approaches to the x-axis as x becomes very large.
當 x 變得很大時，圖像趨近 x 軸。

END OF PAPER
~ 試卷完 ~