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By นัศ

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- ฝึกฝนโปรแกรมในคอมพิวเตอร์

- ver 1.0 ฝึกฝนชื่อ Matrix ฝึกหัด
ที่ฝึกฝนชื่อ 1 และ 2 ฝึกหัด
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①

หาค่าของ $z = i^{-7} + i^{-5} + i^{-3} + i$

แล้ว $|z^2| = ?$

$$z = i^{-7} + i^{-5} + i^{-3} + i = i + -i + i + i = \underline{2i}$$

Diagram showing the simplification of powers of i using the identity $i^{-n} = \frac{1}{i^n}$ and the fact that $i^2 = -1$:

- $i^{-7} = \frac{1}{i^7} = \frac{1}{i^6 \cdot i} = \frac{1}{(i^2)^3 \cdot i} = \frac{1}{(-1)^3 \cdot i} = \frac{1}{-1 \cdot i} = \frac{1}{-i} = \frac{1}{-1} \times \frac{i}{i} = 1 \times i = i$
- $i^{-5} = \frac{1}{i^5} = \frac{1}{i^4 \cdot i} = \frac{1}{(i^2)^2 \cdot i} = \frac{1}{(-1)^2 \cdot i} = \frac{1}{1 \cdot i} = \frac{1}{i} = 1 \times \frac{i}{i} = 1 \times -1 = -1$
- $i^{-3} = \frac{1}{i^3} = \frac{1}{i^2 \cdot i} = \frac{1}{(-1) \cdot i} = \frac{1}{-i} = \frac{1}{-1} \times \frac{i}{i} = 1 \times i = i$

$$|z^2| = |z|^2 = |2i|^2 = 2^2 = 4 \#$$

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② 166 เป็นจำนวนเต็มที่มี 1 หารลงตัว $166 = 1101$
และ $166 \equiv 1 \pmod{11}$ จงหา n

$$\frac{166}{n} \equiv 1 \pmod{11} \therefore \frac{166-1}{n} \text{ ลงตัว } \rightarrow n | 165$$

$$\frac{1101}{n} \equiv 1 \pmod{11} \therefore \frac{1101-1}{n} \text{ ลงตัว } \rightarrow n | 1100$$

$$\therefore n = \text{จำนวน } 165, 1100$$

$$5 \overline{) 165, 1100}$$

$$11 \overline{) 33, 220}$$

$$3, 20$$

$$\therefore \text{จำนวน} = 5 \times 11 = 55 \quad \#$$

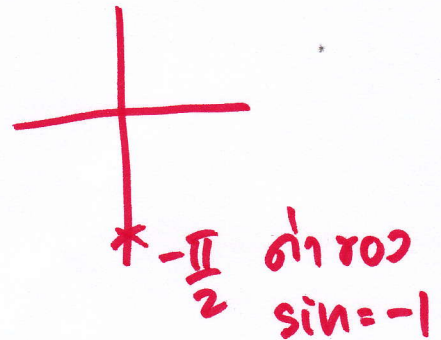
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$$\textcircled{3} \quad 2 \arcsin(x^2 - 3x + 1) + \pi = 0$$

27 62 77 77 77 77 77 77

$$2 \arcsin(x^2 - 3x + 1) = -\pi$$

$$\arcsin(x^2 - 3x + 1) = -\frac{\pi}{2}$$



$$\therefore x^2 - 3x + 1 = -1$$

$$x^2 - 3x + 2 = 0$$

$$(x-2)(x-1) = 0$$

$$x = 2, 1$$

$$\oplus = 3 \#$$

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④) ၂၁^၂ m ပုံစံရှိသော အမှတ်တံဆိပ်ကို $m\bar{a} + \bar{b}$ နှင့် $m\bar{a} - \bar{b}$ အဖြစ် ပြောင်းလဲသောအခါ $|\bar{a}| = 2$ $|\bar{b}| = 5$ ဖြစ်သည်။
 သို့သော် m

$$m\bar{a} + \bar{b} \perp m\bar{a} - \bar{b} \therefore \text{dot} = 0$$

$$(m\bar{a} + \bar{b}) \cdot (m\bar{a} - \bar{b}) = 0$$

$$m^2 |\bar{a}|^2 - |\bar{b}|^2 = 0$$

$$m^2 (2)^2 - (5)^2 = 0$$

$$4m^2 - 25 = 0$$

$$4m^2 = 25$$

$$m^2 = \frac{25}{4}$$

$$m = \frac{5}{2} = \underline{2.5} \quad \#$$

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⑤ મુદ્દા 12 a, b, c નું R

$$M \begin{bmatrix} 1 & 2 & a \\ 3 & 1 & b \\ -1 & 0 & c \end{bmatrix} \sim \begin{bmatrix} 1 & 2 & -1 \\ 0 & -5 & 7 \\ -1 & 0 & 2 \end{bmatrix} \quad R_2 - 3R_1$$

અથવા $a+b+c$

$$\begin{array}{l} R_1: \quad 1 \quad 2 \quad a \\ R_2: \quad 3 \quad 1 \quad b \end{array} \quad \left. \begin{array}{l} \\ \end{array} \right\} R_2 - 3R_1 \quad \begin{array}{l} 3-3(1) \\ 1-3(2) \end{array} \quad \begin{array}{l} b-3a \end{array}$$

↓ નીચેની R_2 તોડત

$$\begin{array}{ccc} 0 & -5 & 7 \end{array}$$

$$\therefore b - 3a = 7$$

અને R_1, R_3 નોડતોડતો $\therefore a = -1, c = 2$



$$b - 3(-1) = 7$$

$$b + 3 = 7$$

$$b = 4$$

$$\therefore a + b + c = -1 + 4 + 2 = 5 \neq$$

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⑥

$$\log_2 (3^{\log_3 16}) = ?$$

$$\log_2 (3^{\log_3 16})$$



$$\log_2 16 = \log_2 2^4 = 4 \#$$

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- ⑦ โรงรถ 404 คัน แบ่งเป็น 4 รุ่น
จากตารางข้างล่างนี้ จงหาค่าเฉลี่ยของรถที่เข้าโรงรถ

รุ่น	จำนวน	ค.ย.เฉลี่ย
1	22	17
2	23	16
3	25	14
4	30	15

$$\bar{X} = \frac{N_1 \bar{X}_1 + N_2 \bar{X}_2 + N_3 \bar{X}_3 + N_4 \bar{X}_4}{N_1 + N_2 + N_3 + N_4}$$

$$= \frac{22(17) + 23(16) + 25(14) + 30(15)}{22 + 23 + 25 + 30}$$

$$= \frac{374 + 368 + 350 + 450}{100}$$

$$= \frac{1542}{100} = 15.42$$

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$$6) \sum_{r=0}^6 (-1)^r \binom{6}{r} 7^{6-r} 5^r = ?$$

የዕቅድ ገጽ ማሳሰቢያ ስለሆነ : የገጽ $(-1)^r$ ስህ 5^r ስህ

$$\sum_{r=0}^6 \binom{6}{r} 7^{6-r} \cdot (-5)^r$$

↓

$$\binom{6}{0} 7^{6-0} \cdot (-5)^0 + \dots + \binom{6}{6} 7^{6-6} \cdot (-5)^6$$

↓

$$= [7 + (-5)]^6$$

$$= 2^6$$

$$= \underline{64} \quad \#$$

$$\begin{aligned} & \binom{6}{0} A^{6-0} \cdot B^0 + \dots + \binom{6}{6} A^{6-6} \cdot B^6 \\ & \quad \downarrow \\ & (A+B)^6 \end{aligned}$$

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$$(9) \lim_{x \rightarrow 0} \frac{(1+x)(1+6x) - 1}{x} = ?$$



$$= \frac{1+x+6x+6x^2-1}{x}$$

$$= \frac{x+6x+6x^2}{x}$$

$$= 1+6+6x$$

$$\downarrow x=0$$

$$= 1+6 = 7 \#$$

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$$(10) \quad \lim_{n \rightarrow \infty} x = \frac{1}{\sqrt[3]{3}} \quad \lim_{n \rightarrow \infty} \sum_{n=0}^{\infty} (-1)^n x^{3n} = ?$$

$$\text{lim } n = 0, 1, 2, 3, \dots \quad 0: \infty^2$$

$$(-1)^0 x^0 + (-1)^1 x^3 + (-1)^2 x^6 + (-1)^3 x^9 + \dots$$

$$\underbrace{x^0 + -x^3}_{x - x^3} + \underbrace{x^6 + -x^9}_{x - x^3} + \dots = \frac{a_1}{1-r}$$

$$= \frac{x^0}{1 - (-x^3)}$$

$$= \frac{1}{1+x^3}$$

$$= \frac{1}{1+\frac{1}{3}} = \frac{1}{\frac{4}{3}}$$

$$= \frac{3}{4} \quad \#$$

$$x = \frac{1}{\sqrt[3]{3}} \rightarrow x^3 = \frac{1}{3}$$

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① $12^3 x_1, x_2, x_3$ 123 123 123 123

$$8x^3 + 6x^2 - 5x - 3 = 0 \quad \text{123 123 } x_1 < x_2 < x_3$$

$$12^3 x_1 + x_3 = ?$$

$$8x^3 + 6x^2 - 5x - 3 = 0$$

$$\downarrow \text{123 } x = -1$$

$$-8 + 6 + 5 - 3 = 0 \quad \checkmark$$

$$\begin{array}{r|rrrr} -1 & 8 & 6 & -5 & -3 \\ & & -8 & 2 & 3 \\ \hline & 8 & -2 & -3 & 0 \end{array}$$

$$8x^2 - 2x - 3 = 0$$

$$(4x - 3)(2x + 1) = 0$$

$$x = \frac{3}{4}, -\frac{1}{2}$$

$$\therefore \begin{array}{ccc} -1 & < & -\frac{1}{2} < \frac{3}{4} \\ x_1 & & x_2 & x_3 \end{array} \quad \left. \vphantom{\begin{array}{ccc} -1 & < & -\frac{1}{2} < \frac{3}{4} \\ x_1 & & x_2 & x_3 \end{array}} \right\} x_1 + x_3 = -1 + \frac{3}{4}$$

$$= -\frac{1}{4} \neq$$

(12) m, n เป็นจำนวนเต็มบวก
 $m = n + 2$, m กับ n หาร 180
 ลงตัว $mn = ?$

$$m = n + 2 \rightarrow m - n = 2$$

$$\text{ตัวประกอบ } 180 = 2 \times 2 \times 3 \times 3 \times 5$$

$$\begin{aligned}
 m &= 2 \times 2 \times 5 = 20 \\
 n &= 2 \times 3 \times 3 = 18
 \end{aligned}
 \left. \vphantom{\begin{aligned} m &= 2 \times 2 \times 5 = 20 \\ n &= 2 \times 3 \times 3 = 18 \end{aligned}} \right\} m - n = 2$$

$$\text{ตัวประกอบ } = 2 \times 2 \times 3 \times 3 \times 5 = \underline{\underline{180}}$$

$$\therefore mn = 20 \times 18 = 360 \#$$

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F បើកចំណុចកំណត់ Q_1 ចង្វាក់ប្រសព្វប្រសព្វ

$$\frac{x^2}{9} - \frac{(y-2)^2}{16} = 1 \quad \text{ឈ្មោះ F បើកចំណុចកំណត់ ចង្វាក់ប្រសព្វប្រសព្វ}$$

ដើម្បី ដឹងពី កំណត់ កំណត់ កំណត់ ចង្វាក់ប្រសព្វប្រសព្វ បើ
ចង្វាក់ ប្រសព្វ ប្រសព្វ

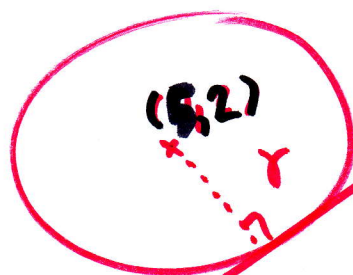
$$\text{ឈ្មោះ } c^2 = a^2 + b^2 = 9 + 16 = 25 \therefore c = 5$$

$$F \begin{pmatrix} (-5, 2) \end{pmatrix} \dots \dots \dots (0, 2) \dots \dots \dots F(5, 2) * : Q_1$$

$$\text{កំណត់: } y - k = \pm \frac{b}{a} (x - h) \rightarrow y - 2 = \pm \frac{4}{3} (x)$$

$$3y - 6 = \pm 4x$$

$$\begin{aligned} \therefore 4x - 3y + 6 &= 0 \\ \therefore 4x + 3y - 6 &= 0 \end{aligned} \quad \left. \begin{array}{l} \text{កំណត់} \\ \text{កំណត់} \end{array} \right\}$$



$$4x - 3y + 6 = 0$$

$$r = \frac{|4(5) - 3(2) + 6|}{\sqrt{4^2 + 3^2}} = \frac{|20 - 6 + 6|}{\sqrt{25}} = \frac{20}{5} = 4$$

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(14) ใ้ $\vec{u}$ และ $\vec{v}$ เป็นเวกเตอร์ใดๆ ในสามมิติ ที่ $\vec{u}$ และ $\vec{v}$ ไม่เป็น
 0 และ $\vec{u}$ และ $\vec{v}$ ไม่ขนานกัน จงพิจารณาข้อต่อไปนี้ และข้อใดผิด

ก) $|\vec{u} \times \vec{v}| \leq |\vec{u}| |\vec{v}|$

ข) $\vec{u} \times (\vec{u} + \vec{v}) = \vec{u} \times \vec{v}$

ค) $|\vec{u} \times \vec{v}|^2 + |\vec{u} \cdot \vec{v}|^2 = |\vec{u}|^2 |\vec{v}|^2$

ง) $(5\vec{u} \times \vec{v}) \cdot (5\vec{v}) = 25$ ผิดทุกข้อ

ก) $|\vec{u} \times \vec{v}| = |\vec{u}| |\vec{v}| \sin \theta \leq |\vec{u}| |\vec{v}|$ เมื่อ $\sin \theta \in [-1, 1]$ ถูก

ข) $\vec{u} \times (\vec{u} + \vec{v}) = \underbrace{\vec{u} \times \vec{u}}_{\vec{0}} + \vec{u} \times \vec{v} = \vec{u} \times \vec{v}$ ถูก

ค) $|\vec{u} \times \vec{v}|^2 = |\vec{u}|^2 |\vec{v}|^2 \sin^2 \theta$
 $|\vec{u} \cdot \vec{v}|^2 = |\vec{u}|^2 |\vec{v}|^2 \cos^2 \theta$ $\left\{ \begin{array}{l} |\vec{u}|^2 |\vec{v}|^2 (\sin^2 \theta + \cos^2 \theta) \\ = |\vec{u}|^2 |\vec{v}|^2 \therefore \text{ถูก} \end{array} \right.$

ง) $(5\vec{u} \times \vec{v}) \cdot (5\vec{v})$
 ↓ ขนานกัน

ทุกข้อ

$\vec{u} = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$ $\vec{v} = \begin{bmatrix} 1 \\ 2 \\ 1 \end{bmatrix}$ $\left\{ \begin{array}{l} 5\vec{u} = \begin{bmatrix} 5 \\ 5 \\ 5 \end{bmatrix} \\ 5\vec{v} = \begin{bmatrix} 5 \\ 10 \\ 5 \end{bmatrix} \end{array} \right\}$ $5\vec{u} \times \vec{v} = \begin{bmatrix} -5 \\ 0 \\ 5 \end{bmatrix}$

$\left| \begin{array}{ccc|cc} i & j & k & i & j \\ 5 & 5 & 5 & 5 & 5 \\ 1 & 2 & 1 & 1 & 2 \end{array} \right|$

$\rightarrow (5\vec{u} \times \vec{v}) \cdot (5\vec{v})$
 $\begin{bmatrix} -5 \\ 0 \\ 5 \end{bmatrix} \cdot \begin{bmatrix} 5 \\ 10 \\ 5 \end{bmatrix}$
 $= -25 + 0 + 25$
 $= 0 \neq \text{ผิด}$

(15) ให้นิ z_1, z_2, z_3 เป็นรากที่ 3 ของ $z^3 = 1$ และ $z_1 = \sqrt{2}(\cos 15^\circ + i \sin 15^\circ)$ จงหา $z_2 z_3$

z_1, z_2, z_3 เป็นรากที่ 3 แปรกัน นั่นคือ $\frac{360^\circ}{3} = \underline{120^\circ}$

$\therefore$ มุมของ z_1 120° 120° 120°

$$z_1 = \sqrt{2} \operatorname{cis} 15^\circ$$

$$z_2 = \sqrt{2} \operatorname{cis} 135^\circ$$

$$z_3 = \sqrt{2} \operatorname{cis} 255^\circ$$

$$\left. \begin{array}{l} z_2 = \sqrt{2} \operatorname{cis} 135^\circ \\ z_3 = \sqrt{2} \operatorname{cis} 255^\circ \end{array} \right\} z_2 z_3 = \sqrt{2} \operatorname{cis} 135^\circ \times \sqrt{2} \operatorname{cis} 255^\circ$$

$$2 \operatorname{cis} (135^\circ + 255^\circ)$$

$$2 \operatorname{cis} (390^\circ)$$

$$2 \operatorname{cis} 30^\circ$$

$$2(\cos 30^\circ + i \sin 30^\circ)$$

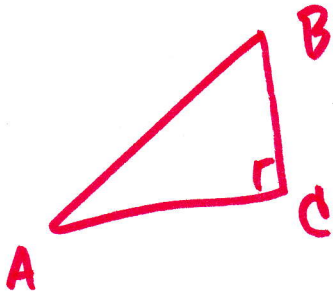
$$2\left(\frac{\sqrt{3}}{2} + \frac{i}{2}\right)$$

$$= \sqrt{3} + i \quad \#$$

(16) ให้อ ABC เป็น Δ มีมุม C เป็นมุมฉาก และ $\hat{A} \leq \hat{B}$

$$m^2 (\cos 2A + \cos B)^2 + (\sin 2A + \sin B)^2 = 3$$

และ $\tan 3A = ?$



น: มุมฉากที่ C: 90°

$$\underbrace{\cos^2 2A + 2 \cos 2A \cos B + \cos^2 B + \sin^2 2A + 2 \sin 2A \sin B + \sin^2 B}_{=1} = 3$$

$$2 + 2 (\cos 2A \cos B + \sin 2A \sin B) = 3$$

* *
ให้คำตอบ!!!

$$\cos 2A \cos B + \sin 2A \sin B = \frac{1}{2}$$

$A \leq B \therefore \cos(B-2A) = \frac{1}{2}$
 $B-2A = 60^\circ - (1)$
 $A+B = 90^\circ - (2)$
 $(2)-(1): 3A = 30^\circ$
 $A = 10^\circ \rightarrow B = 80^\circ$
 $\therefore \tan 3A = \tan 30^\circ = \frac{1}{\sqrt{3}}$

$$\cos(2A-B) = \frac{1}{2}$$

$\Downarrow$
 60°

$$\therefore 2A-B = 60^\circ - (1)$$

จึงได้

$$A+B = 90^\circ - (2)$$

$$\therefore (1)+(2) \quad 3A = 150^\circ$$

ดังนั้น T-T

$$A = 50^\circ$$

$$\tan 3A = \tan 150^\circ = -\frac{1}{\sqrt{3}} \rightarrow \text{www.tutoroui.com}$$

(17) $2^x \cdot 2^{x+1} \cdot 2^{x+2} = 4^x + 4^{x+1} + 4^{x+2}$ ၁၂၅၇၈၇၈

1. $\log_2 \frac{21}{10}$

2. $\log_2 \frac{21}{8}$

3. $\log_2 \frac{21}{6}$

4. $\log_2 \frac{21}{4}$

5. $\log_2 \frac{21}{2}$

$$2^x \cdot 2^x \cdot 2^1 \cdot 2^x \cdot 2^2 = 2^{2x} + 2^{2x} \cdot 4 + 2^{2x} \cdot 4^2$$

$$2^{3x} \cdot 2^3 = 2^{2x} [1 + 4 + 4^2]$$

$$2^{3x} \cdot 8 = 2^{2x} \cdot 21$$

$$\frac{2^{3x}}{2^{2x}} = \frac{21}{8}$$

$$2^x = \frac{21}{8}$$

$$x = \log_2 \frac{21}{8} \quad \#$$

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(18)

$$\log_2 x + 6 \log_x 2 - 5 = 0 \quad \text{סוס סא סא סא סא סא סא}$$

1. 8 2. 10 3. 12 4. 14 5. 16

$$\log_2 x + \frac{6}{\log_2 x} - 5 = 0$$

$$\text{נניח } A = \log_2 x : \quad A + \frac{6}{A} - 5 = 0$$

$$A^2 + 6 - 5A = 0$$

$$A^2 - 5A + 6 = 0$$

$$(A-3)(A-2) = 0$$

$$A = 3, 2$$

$$\log_2 x = 3, 2$$

$$x = 2^3, 2^2$$

$$x = \underline{8, 4}$$

$$\oplus = 12 \#$$

$$(20) \quad \text{Let } S = \{1, 2, 3, \dots, 10\}$$

$$M = \{(x, y) \mid x, y \in S\}$$

Let (x, y) be an element of M
 The condition is: (x, y) is in M if $x^2 + y^2 < 25$
 and x, y are integers

$$n(S) = \frac{10}{x} \times \frac{10}{y} = \underline{\underline{100}}$$

$$n(E): \quad x=1: \quad 1^2 + y^2 < 25 \rightarrow y^2 < 24$$

$$y = 1, 2, 3, 4$$

$$\therefore 4 \text{ elements}$$

$$x=2: \quad 2^2 + y^2 < 25 \rightarrow y^2 < 21$$

$$y = 1, 2, 3, 4$$

$$\therefore 4 \text{ elements}$$

$$x=3: \quad 3^2 + y^2 < 25 \rightarrow y^2 < 16$$

$$y = 1, 2, 3$$

$$\therefore 3 \text{ elements}$$

$$x=4: \quad 4^2 + y^2 < 25 \rightarrow y^2 < 9$$

$$y = 1, 2$$

$$\therefore 2 \text{ elements}$$

$$\therefore n(E) = 4 + 4 + 3 + 2 = 13$$

$$\text{www.tutoroui.com} =$$

$$P = \frac{13}{100} \neq$$

$$(21) \quad S = \{1, 2, 3, \dots, 10\}$$

$$M = \left\{ \begin{bmatrix} x & y \\ z & x \end{bmatrix} \mid x, y, z \in S \right\}$$

หาค่าเฉลี่ยของเมทริกซ์ $\begin{bmatrix} x & y \\ z & x \end{bmatrix}$ ใน M และ 1 เมทริกซ์จตุรัส

ตามเงื่อนไข: เป็นที่ที่ $x < y$ หรือ $x < z$
มีค่าเท่าใด

$$n(S) = \frac{10 \times 10 \times 10}{x \quad y \quad z} = \underline{\underline{1000}}$$

$$n(E) : x < y, x < z$$

$$x=1 \quad 1 < y \quad 1 < z$$

$$\frac{9}{y} \times \frac{9}{z} = 81$$

$$x=2 \quad 2 < y \quad 2 < z$$

$$\frac{8}{y} \times \frac{8}{z} = 64$$

$$x=3 \quad 3 < y \quad 3 < z$$

$$\frac{7}{y} \times \frac{7}{z} = 49$$

$$x=4$$

$$6 \times 6 = 36$$

$$x=5$$

$$5 \times 5 = 25$$

$$\vdots$$

$$x=9$$

$$1 \times 1 = 1$$

$$n(E) = 1^2 + 2^2 + 3^2 + \dots + 7^2 + 8^2 + 9^2 = \sum n^2 = \frac{n(n+1)(2n+1)}{6}$$

$$= \frac{9(10)(19)}{6} = \underline{\underline{285}}$$

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$$P = \frac{285}{1000} \neq$$

22

$n = 1146$	$\hat{p} = 0.7474$
31-40	6
41-50	x
51-60	18
61-70	25
71-80	10
81-90	y
91-100	3

$\vec{P}_{20} = 50.5$ เมื่อใช้กฎของนิวตันที่ $\vec{P}_1 = 1144$ ต่ำสุด ที่ $\vec{P}_1$
 เมื่อ A ที่ $\vec{P}_1 = 1144$

	D9474
31-40	6
41-50	X
51-60	18
61-70	25
71-80	10
81-90	4
91-100	3

$\Rightarrow P_{20} = 50.5$

$$\therefore 4(6+x) = 18 + 25 + 10 + 4 + 3$$

$$24 + 4x = 56 + 4$$

$$4x - y = 32 \quad \text{--- (1)}$$

$$N=80 \rightarrow 62+x+y=80$$

$$x + y = 18 \text{ --- (2)}$$

$$P_{90} \text{ סדרה } 47 = \frac{N}{100}(90) = 72$$

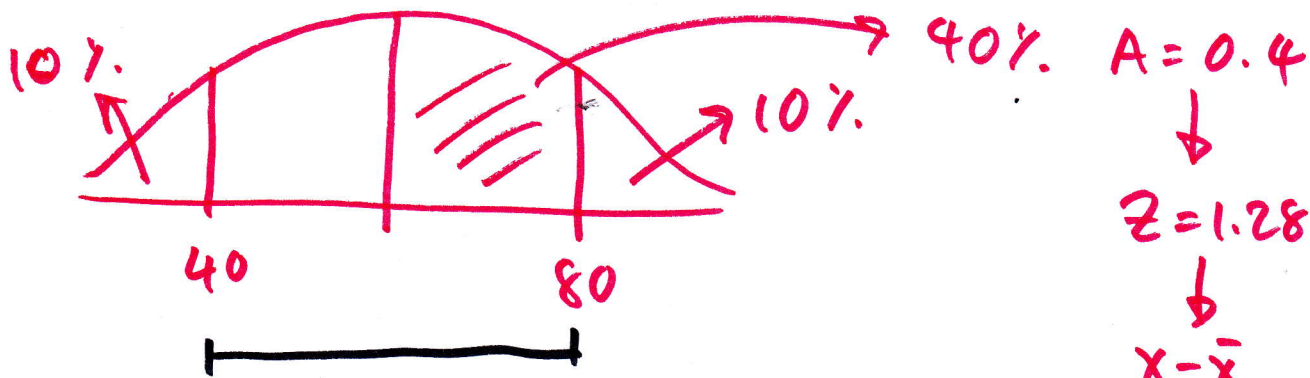
$$\textcircled{1} + \textcircled{2} : 5x = 50$$

$$x=10 \rightarrow y=8$$

04' 81-90

$$x_{90} = 10.5 + 10 \left[\frac{72 - 69}{8} \right] = \underline{\underline{84.25}}$$

(29) $\sigma = 1144$ လေ့လာသူ ၁၀၀ ဦးပါရှိသော ကလပ်အသင်း ၁၀၀ က အသင်း၏
 ကိုယ်စားပြု ခံကိုင်သူ ၁၀% ခံကိုင်သူများကို ရွေးချယ်ရာမှ $\sigma = 1144$
 သာကလျှံ ၈၀ $\sigma = 1144$ ခံကိုင်သူ ၁၀% ခံကိုင်သူများကို ရွေးချယ်ရာမှ
 ကိုယ်စားပြု $\sigma = 1144$ သာကလျှံ ၄၀ $\sigma = 1144$ ခံကိုင်သူ
 ခံကိုင်သူများကို ရွေးချယ်ရာမှ $\sigma = 1144$ သာကလျှံ ၆၅ $\sigma = 1144$ ခံကိုင်သူများကို
 ($z = 1.28 \rightarrow A = 0.4$, $z = 0.92 \rightarrow A = 0.1255$)

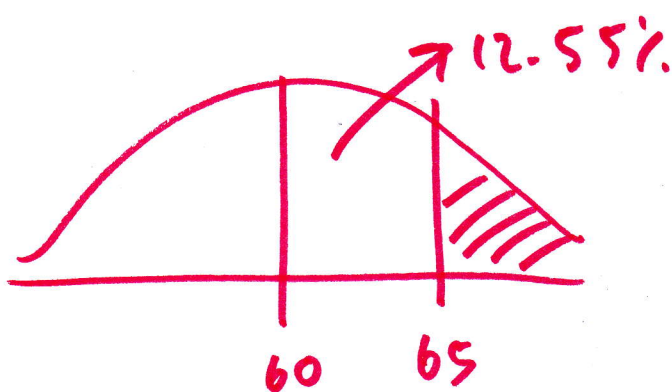


သို့သော်လည်း သာကလျှံ ၈၀ ခံကိုင်သူ ၁၀%.

$$\therefore \bar{x} = \frac{40 + 80}{2} = \frac{120}{2} = 60$$

$$\begin{aligned} &\downarrow \\ z &= 1.28 \\ &\downarrow \\ \frac{x - \bar{x}}{SD} &= 1.28 \\ \frac{80 - 60}{SD} &= 1.28 \end{aligned}$$

$$SD = \frac{20}{1.28} = 15.625$$



$$x = 65 \rightarrow z = \frac{65 - 60}{15.625} = \frac{5}{15.625} = 0.32 \rightarrow A = 0.1255$$

12.55%

$$\therefore > 65 \sigma = 1144 = 50 - 12.55\%$$

$$= 37.45\% \neq$$

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$$(24) \quad f(x) = \begin{cases} g(x), & x \leq 1 \\ x^3 + 2x, & x > 1 \end{cases}$$

$f(x)$ ជា ฟังก์ชันต่อเนื่องที่ $x=1$ และ $(f \circ g)'(1) = 58$
 จงหา $g'(1) = ?$

$$\text{ต่อเนื่องที่ } x=1 \Rightarrow \lim_{x \rightarrow 1^-} f(x) = \lim_{x \rightarrow 1^+} f(x) = f(1)$$

$$g(1) \qquad \qquad 1^3 + 2(1)$$

$$g(1) = 1 + 2 = 3$$

$$\text{จาก } (f \circ g)'(1) = 58$$

$$f'(g(1)) \cdot g'(1) = 58$$

$$f'(3) \cdot g'(1) = 58$$

$$29 \cdot g'(1) = 58$$

$$g'(1) = 2 \quad \#$$

$$\begin{aligned} x > 1 \\ f(x) &= x^3 + 2x \\ f'(x) &= 3x^2 + 2 \\ f'(3) &= 27 + 2 = 29 \end{aligned}$$

(25) $a \in \mathbb{R}, |a| < 1$

$$S_n = (a+1)^2 + (a^2+1)^2 + (a^3+1)^2 + \dots + (a^n+1)^2$$

$$\lim_{n \rightarrow \infty} (S_n - n) = ?$$

$$S_n = \sum_{n=1}^n (a^n + 1)^2 = \sum_{n=1}^n (a^{2n} + 2a^n + 1)$$

$$= \sum a^{2n} + 2 \sum a^n + \underbrace{\sum 1}_{=n}$$

$$\therefore \lim_{n \rightarrow \infty} (S_n - n) = \lim_{n \rightarrow \infty} \left[\sum a^{2n} + 2 \sum a^n \right]$$

$$= \sum_{n=1}^{\infty} a^{2n} + 2 \sum_{n=1}^{\infty} a^n$$

$$= \left[\underbrace{a^2 + a^4 + a^6 + \dots}_{\times a^2} \right] + 2 \left[\underbrace{a^1 + a^2 + a^3 + \dots}_{\times a} \right]$$

$$= \frac{a^2}{1-a^2} + 2 \left[\frac{a}{1-a} \right]$$

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

$$= \frac{a^2 + 2a(1+a)}{(1-a)(1+a)} = \frac{a^2 + 2a + 2a^2}{1-a^2} = \frac{3a^2 + 2a}{1-a^2}$$

(26) $a_1, a_2, \dots, a_9$ ជាលំດាប់រេកលីនា
ដូចមានលំດាប់ 15 ហេតុអ្វី $a_1, a_2, \dots, a_9 = ?$

$$a_1, \dots, a_9 \text{ ដូច } M_2 = \underbrace{a_5}_{a_1 + 4d} = 15 \quad \text{--- (1)}$$

$$a_1 + \dots + a_9 = S_9 = \frac{9}{2} [2a_1 + 8d]$$

$$= 9 [\underbrace{a_1 + 4d}_{\text{(1)}}$$

$$= 9 [15]$$

$$= \underline{135} \quad \#$$

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(27)

$$5 \text{ ឧបស } 4^{999} + 9^{555}$$

១: 1050 រំលឹក រំលឹក

រំលឹក រំលឹក: រំលឹក រំលឹក រំលឹក រំលឹក + រំលឹក

4^{999} :

$4^1 = 4$	$4^2 = 16$	$4^3 = 64$	$4^4 = 256$
$\downarrow \div 5$	$\downarrow \div 5$	$\downarrow \div 5$	$\downarrow \div 5$
រំលឹក 4	រំលឹក 1	រំលឹក 4	រំលឹក 1

$4^5 = 1024$	$4^6 = 4096$
$\downarrow \div 5$	$\downarrow \div 5$
រំលឹក 4	រំលឹក 1

$\therefore 4^{999} \div 5 \text{ រំលឹក } 4, 4^{555} \div 5 \text{ រំលឹក } 1$

9^{555} :

$9^1 = 9$	$9^2 = 81$	$9^3 = 729$
$\downarrow \div 5$	$\downarrow \div 5$	$\downarrow \div 5$
រំលឹក 4	រំលឹក 1	រំលឹក 4

$9^4 = 6561$

$\downarrow \div 5$

រំលឹក 1

$\therefore 9^{555} \div 5 \text{ រំលឹក } 4$

$9^{555} \div 5 \text{ រំលឹក } 1$

$\therefore 4^{999} + 9^{555} \xrightarrow{\div 5} \text{រំលឹក } 4 + 4 = 8 \xrightarrow{\div 5} \text{រំលឹក } 3$

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រំលឹក រំលឹក ③

(28) x^2 မှ x သို့မဟုတ် $4x+1$

[illegible]

$$F(x) = \int f(x) dx$$

$$g(n) = m \cdot f = 2x + 1$$

$$f'(x) = 2x + 1$$

$$f(x) = \int 4x + 1 dx = 4 \frac{x^2}{2} + x + C$$

$$f(x) = 2x^2 + x + C \xrightarrow{\text{with } (1,0)} 2 + 1 + C = 0$$
$$f(1) = 0 \quad C = -3$$

$$f(x) = 2x^2 + x - 3$$

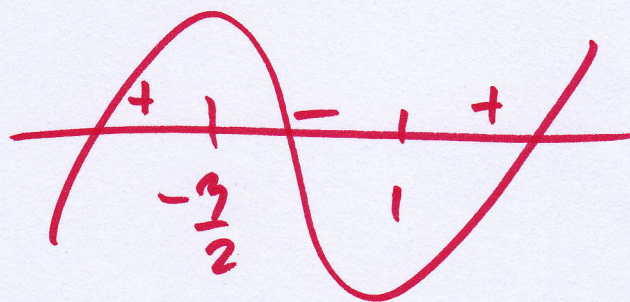
$$\therefore F(x) = \int 2x^2 + x - 3 \, dx$$

หลัก 2 คือ ความสำเร็จ & ความสำเร็จ = MAX ที่ 144

$$\therefore f'(x) = f(x) = 2x^2 + x - 3 = (2x+3)(x-1)$$

$\therefore F(x)$ သည် MAX

$$n^j \quad x = -\frac{3}{2} \quad \#$$



(29) Let $A = [a_{ij}]_{3 \times 3}$ for which $\det A > 0$

Let $M_{ij}(A) =$ Minor of a_{ij}

$$[M_{ij}(A)] = \begin{bmatrix} 1 & -3 & 5 \\ 1 & 2 & -1 \\ 2 & 4 & 3 \end{bmatrix}$$

Let $A^{-1} = [b_{ij}]$ then $b_{11} + b_{12} + b_{13} = ?$

$$\begin{bmatrix} M_{11} & M_{12} & M_{13} \\ M_{21} & M_{22} & M_{23} \\ M_{31} & M_{32} & M_{33} \end{bmatrix} = \begin{bmatrix} 1 & -3 & 5 \\ 1 & 2 & -1 \\ 2 & 4 & 3 \end{bmatrix}$$

then $\text{adj } A = \begin{bmatrix} C_{11} & C_{21} & C_{31} \\ C_{12} & C_{22} & C_{32} \\ C_{13} & C_{23} & C_{33} \end{bmatrix} = \begin{bmatrix} M_{11} & -M_{21} & M_{31} \\ -M_{12} & M_{22} & -M_{32} \\ M_{13} & -M_{23} & M_{33} \end{bmatrix}$

$$\text{adj } A = \begin{bmatrix} 1 & -1 & 2 \\ -3 & 2 & -4 \\ 5 & 1 & 3 \end{bmatrix} \Rightarrow \det(\text{adj } A) = 6 + 20 + 6 - 20 + 4 + 9$$

$$(\det A)^{3-1} = 25$$

$$(\det A)^2 = 25 \rightarrow \det A = 5$$

$$A^{-1} = \frac{\text{adj } A}{\det A} = \frac{\begin{bmatrix} 1 & -1 & 2 \\ -3 & 2 & -4 \\ 5 & 1 & 3 \end{bmatrix}}{5} \Rightarrow b_{11} + b_{12} + b_{13}$$

$$\frac{1}{5} + \frac{-1}{5} + \frac{2}{5} = \frac{2}{5} \neq$$

(30) $f(x) = \begin{vmatrix} x & x & x \\ 0 & x-3 & x \\ 0 & 0 & x+3 \end{vmatrix}$

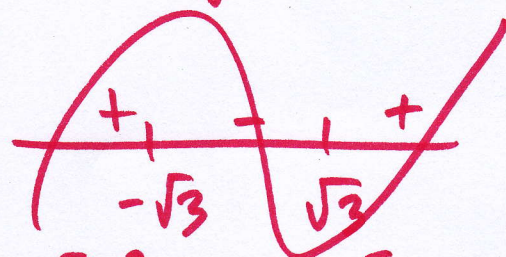
ห้ m และ M คือ ค่าต่ำสุดและค่าสูงสุด
 ของ $f(x)$ บนช่วง S และ $S = \{a \mid a \text{ เป็นจำนวน}$
 เต็ม ซึ่ง $m \leq f(x) \leq M\}$ จงหาขนาดของ $S = ?$

1. 4 2. 5 3. 6 4. 7 5. 8

เรา $f(x)$ จาก $\det$ ได้ $f(x) = x(x-3)(x+3)$ (5) 1011478=11478, 464

$f(x) = x(x-3)(x+3) = x^3 - 9x$

$f'(x) = 3x^2 - 9 = 3(x - \sqrt{3})(x + \sqrt{3})$



Max ที่ $x = -\sqrt{3} \rightarrow M = f(-\sqrt{3}) = (-\sqrt{3})^3 - 9(-\sqrt{3})$
 $= -3\sqrt{3} + 9\sqrt{3} = 6\sqrt{3}$

Min ที่ $x = \sqrt{3} \rightarrow m = f(\sqrt{3}) = (\sqrt{3})^3 - 9(\sqrt{3}) = 3\sqrt{3} - 9\sqrt{3}$
 $= -6\sqrt{3}$

$\therefore m \leq f(x) \leq M$

$-6\sqrt{3} \leq f(x) \leq 6\sqrt{3} \approx -10.2 \leq f(x) \leq 10.2$

$f(0) = 0$ $f(1) = 1 - 9 = -8$ $f(2) = 8 - 18 = -10$ $f(3) = 27 - 27 = 0$

$f(4) = 64 - 36 = 28$ X

$f(-1) = -1 + 9 = 8$ $f(-2) = -8 + 18 = 10$ $f(-3) = -27 + 27 = 0$

$f(-4) = -64 + 36 = -28$ X $\therefore a = -3, -2, -1, 0, 1, 2, 3$