SOLUTION

CSE 423

Set A **COMPUTER GRAPHICS** **MARKS: (/20)**

MPL QUIZ-02
SUMMER-2025

Name:	ID:	Sec:

Time (20 mins)

CO2|Q1)

a) Given that the starting point of a line is **(a,b)**. While drawing the line using the **MPL algorithm** for **zone 6**. The **SE(South East) pixel** was selected **4 times** and the **S(South) pixel** was selected **6 times**. What will be the **endpoint** of the line? **(5 Marks)**

b) Consider a straight line with equation $(y=\frac{1}{3}x + 12)$ which cuts the **y axis at A** and **x axis at B**. Given that the line goes from **A to B**. **Find** the zone of the line and **calculate** the **first 5 pixels (including the first pixel)** of the line in its original zone. You **may** use **8 way-Symmetry** if necessary. **[15 Marks]**

a) after SE pixel 4 times $\longrightarrow (a+4, b-4)$

after S 6 times $\longrightarrow (a+4, b-4-6)$

(Ans) $\longrightarrow (a+4, b-10)$

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b) $A(0,12) \longrightarrow B(-36,0)$

$dy = -12 \quad dx = -36 \longrightarrow$ zone 4

$x_n = -x$
$y_n = -y$

zone 0 $\rightarrow A(0,-12) \longrightarrow B(36,0)$

$dy = 12 \quad dx = 36$

$\Delta NE = 2(dy - dx) = -48$
$\Delta E = 2dy = 24$
$dinit = 2dy - dx = -12$

	x	y	d	OE/NE	(Zone 0) PIXEL	(Zone 4) PIXEL
①	0	-12	-12	OE	(0, -12)	(0, 12)
②	1	-12	12	ONE	(1, -12)	(-1, 12)
③	2	-11	-36	OE	(2, -11)	(-2, 11)
④	3	-11	-12	OE	(3, -11)	(-3, 11)
⑤	4	-11	~	~	(4, -11)	(-4, 11)

Ans:

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Set B **COMPUTER GRAPHICS** **MARKS: (/20)**

MPL QUIZ-02
SUMMER-2025

Name:	ID:	Sec:

Time (20 mins)

CO2|Q1)

a) Given that the starting point of a line is **(a,b)**. While drawing the line using the **MPL algorithm** for **zone 2**. The **NW(North West) pixel** was selected **5 times** and the **N(North) pixel** was selected **8 times**. What will be the **endpoint** of the line? **(5 Marks)**

b) Consider a straight line with equation ***y=2x+18*** which cuts the **y axis at A** and **x axis at B**. Given that the line goes from **A to B**. **Find** the zone of the line and **calculate** the **first 5 pixels (including the first pixel)** of the line in its original zone. You **may** use **8 way-Symmetry** if necessary. **[15 Marks]**

a) after NW pixel 5 times → (a-5, b+5)

" N " 8 times → (a-5, b+5+8)

(Ans) → (a-5, b+13)

b) A(0, 18) → B(-9, 0)

dy = -18 dx = -9 → zone 5

$x_n = -y$, $y_n = -x$

Zone 0 → A(-18, 0) → B(0, 9)

dy = 9 dx = 18

ΔE = 18

ΔNE = -18

limit = 0

	x	y	d	ΔE/NE	(Zone 0) Pixel	(Zone 5) Pixel
①	-18	0	0	ΔNE	(-18, 0)	(0, 18)
②	-17	1	-18	ΔE	(-17, 1)	(-1, 17)
③	-16	1	0	ΔNE	(-16, 1)	(-1, 16)
④	-15	2	-18	ΔE	(-15, 2)	(-2, 15)
⑤	-14	2	~	~	(-14, 2)	(-2, 14)

Ans !

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Set C **COMPUTER GRAPHICS** **MARKS: (/20)**

MPL QUIZ-02
SUMMER-2025

Name:	ID:	Sec:

Time (20 mins)

CO2|Q1)

a) Given that the starting point of a line is **(a,b)**. While drawing the line using the **MPL algorithm** for **zone 6**. The **SW(South West) pixel** was selected **7 times** and the **S(South) pixel** was selected **12 times**. What will be the **endpoint** of the line? **(5 Marks)**

b) Consider a straight line with equation($y=\frac{1}{3}x + 12$)which cuts the **x axis at A** and **y axis at B**. Given that the line goes from **A to B**. **Find** the zone of the line and **calculate** the **first 5 pixels (including the first pixel)** of the line in its original zone. You **may** use **8 way-Symmetry** if necessary. **[15 Marks]**

a) after SW pixel 7 times → (a-7, b-7)
" S " 12 times → (a-7, b-7-12)

(Ans) → (a-7, b-19)

b) A(-36, 0) → B(0, 12)

dy = 12 dx = 36 → zone 0

OE = 24 ONE = -48 dinit = -12

	x	y	d	ONE/OE	Pixel (zone 0)
①	-36	0	-12	OE	(-36, 0)
②	-35	0	12	ONE	(-35, 0)
③	-34	1	-36	OE	(-34, 1)
④	-33	1	-12	OE	(-33, 1)
⑤	-32	1	~	~	(-32, 1)

Ans

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Set D **COMPUTER GRAPHICS** **MARKS: (___/20)**

MPL QUIZ-02
SUMMER-2025

Name:	ID:	Sec:

Time (20 mins)

CO2|Q1)

a) Given that the starting point of a line is **(a,b)**. While drawing the line using the **MPL algorithm** for **zone 2**. The **NW(North West) pixel** was selected **12 times** and the **N(North) pixel** was selected **15 times**. What will be the **endpoint** of the line? **(5 Marks)**

b) Consider a straight line with equation ***y=2x+18*** which cuts the **x axis at A** and **y axis at B**. Given that the line goes from **A to B**. **Find** the zone of the line and **calculate** the **first 5 pixels (including the first pixel)** of the line in its original zone. You **may** use **8 way-Symmetry** if necessary. **[15 Marks]**

a) after NW pixel 12 times → (a − 12, b + 12)

after N " 15 times → (a − 12, b + 12 + 15)

(Ans) → (a − 12, b + 27)

b)

A(−9, 0) → B(0, 18)

dy = 18, dx = 9 → zone 1

$x_n = y$

$y_n = x$

A(0, −9) → B(18, 0)

dy = 9, dx = 18

ΔE = 18

ΔNE = −18

dinit = 0

	x	y	d	ΔE/ΔNE	(zone 0) PIXEL	(zone 1) PIXEL
①	0	−9	0	ΔNE	(0, −9)	(−9, 0)
②	1	−8	−18	ΔE	(1, −8)	(−8, 1)
③	2	−8	0	ΔNE	(2, −8)	(−8, 2)
④	3	−7	−18	ΔE	(3, −7)	(−7, 3)
⑤	4	−7	~	~	(4, −7)	(−7, 4)

Ans!