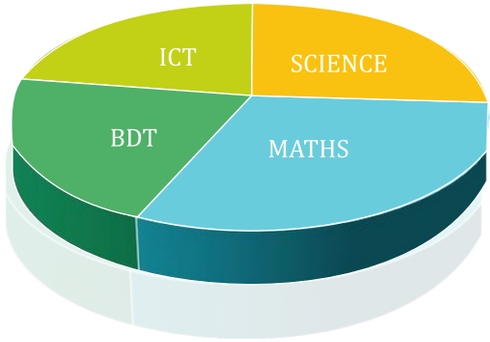
SCRIBBLE WORKS PUBLISHING HOUSE

THE LAST ASSIGNMENT+

ANSWER BOOKLET

FINAL ANSWERS
CHARTS
TABLES &
GRAPHS



UNIT 1

DIAGNOSTIC ASSESSMENT

ACTIVITY 1.1

a) 6.246 km
b) 130
c) One 10p coin and one 20p coin
d) 560

ACTIVITY 1.2

a) 467
b) -3
c) GH₵225.00
d) 60 animals

ACTIVITY 1.3

a) 45
b) 10
c) 17
d) -50

ACTIVITY 1.4

a) -97
b) -14
c) -1
d) 11

ACTIVITY 1.5

a) 40 (nearest ten)
b) 4.9 (1 dp.)
c) 938.83 (2 dp.)
d) 8921000 (nearest thousand)
e) 0.0003 (1 s.f.)
f) 0.00385 (3 s.f.)
g) 9900 (nearest thousand)
i) 2.3×10^{-1}
j) 2.34×10^{6}
k) -5.36×10^{-3}
l) 5.97×10^{-4}

ACTIVITY 1.6

a) 0.025
b) 0.625
c) 0.04
d) 0.048

a) $\frac{1}{2}$
b) $\frac{1}{100}$
c) $\frac{1253}{250}$
d) $\frac{237521}{10000}$

ACTIVITY 1.7

a) 40%
b) 31.25%
c) 90%
d) 85%

a) $\frac{1}{20}$
b) $\frac{1}{2}$
c) $\frac{73.5}{100}$
d) $\frac{5}{4}$

ACTIVITY 1.8

a) 5%
b) 125%
c) 0.75%
d) 5%

ACTIVITY 1.9

a) $-9 < 0 < \frac{2}{9} < \frac{3}{5}$
b) $0.621 < \frac{5}{8} < \frac{9}{10}$
c) $-\frac{1}{3} < 27\% < 0.32 < \frac{2}{5}$

ACTIVITY 1.10

a) $\frac{3}{4} > \frac{2}{3} > \frac{3}{5}$
b) $62.5 > \frac{8}{9} > 62\%$
c) $0.55 > 0.510 > 0.5 > 0.05$

ACTIVITY 1.11

a) $3\frac{7}{10}$
b) $3\frac{3}{4}$
c) $\frac{1}{2}$
d) $\frac{7}{15}$

ACTIVITY 1.12

a) 5cm
b) 600m or 0.6km
c) 24.5 million
d) GH₵10,000.00
e) $\frac{1}{4}$

ACTIVITY 1.13

a) 3.7
b) 0.15
c) 2.746
d) 416.54
e) 16.093
f) 103.867
g) 198.635
h) 120.877
i) 20.743
k) 79.98

ACTIVITY 1.14

a) 0.6
b) 19.78
c) 0.00448
d) 81.25

ACTIVITY 1.15

a) 0.02
b) 9.2
c) 0.2
d) 1.8

ACTIVITY 1.16

a) 5,256
b) 25,772
c) 164,619
d) 19,260

ACTIVITY 1.17

a) -20p
b) $w + 10p^2$
c) $7m + 4n$
d) $3abc - 10acb$

ACTIVITY 1.18

a) $3a^2b^2$
b) $14a + 21b$
c) $a^2 + 9a + 20$
d) $12a - 3$

ACTIVITY 1.19

i) 80°; acute angle
ii) 120°; reflex angle

ACTIVITY 1.20

i) |AB| = 12cm

ii)

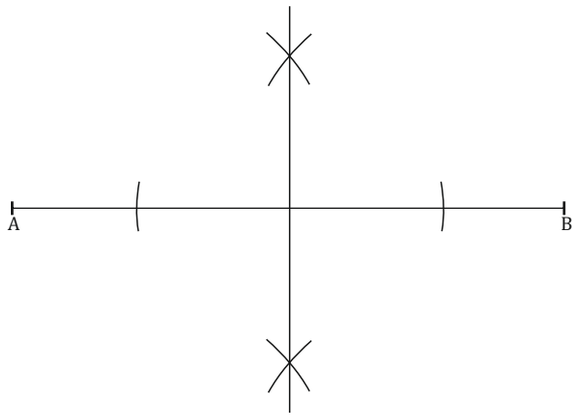


Diagram Not Drawn To Scale

iii) |AP| = 6cm

ACTIVITY 1.21

i) |MN| = 8cm
ii)

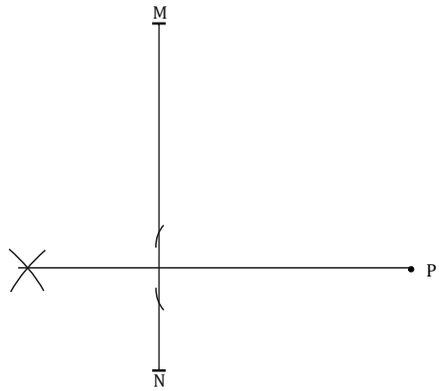


Diagram Not Drawn To Scale

ACTIVITY 1.22

i) $\angle PQR = 120°$

ii)

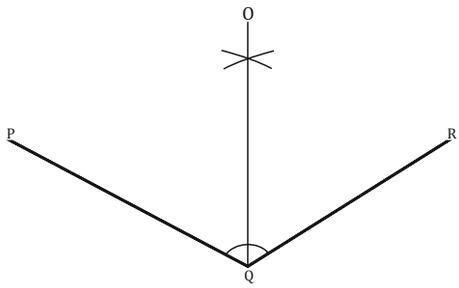


Diagram Not Drawn To Scale

iii) $\angle PQO = 60°$
$\angle OQR = 60°$

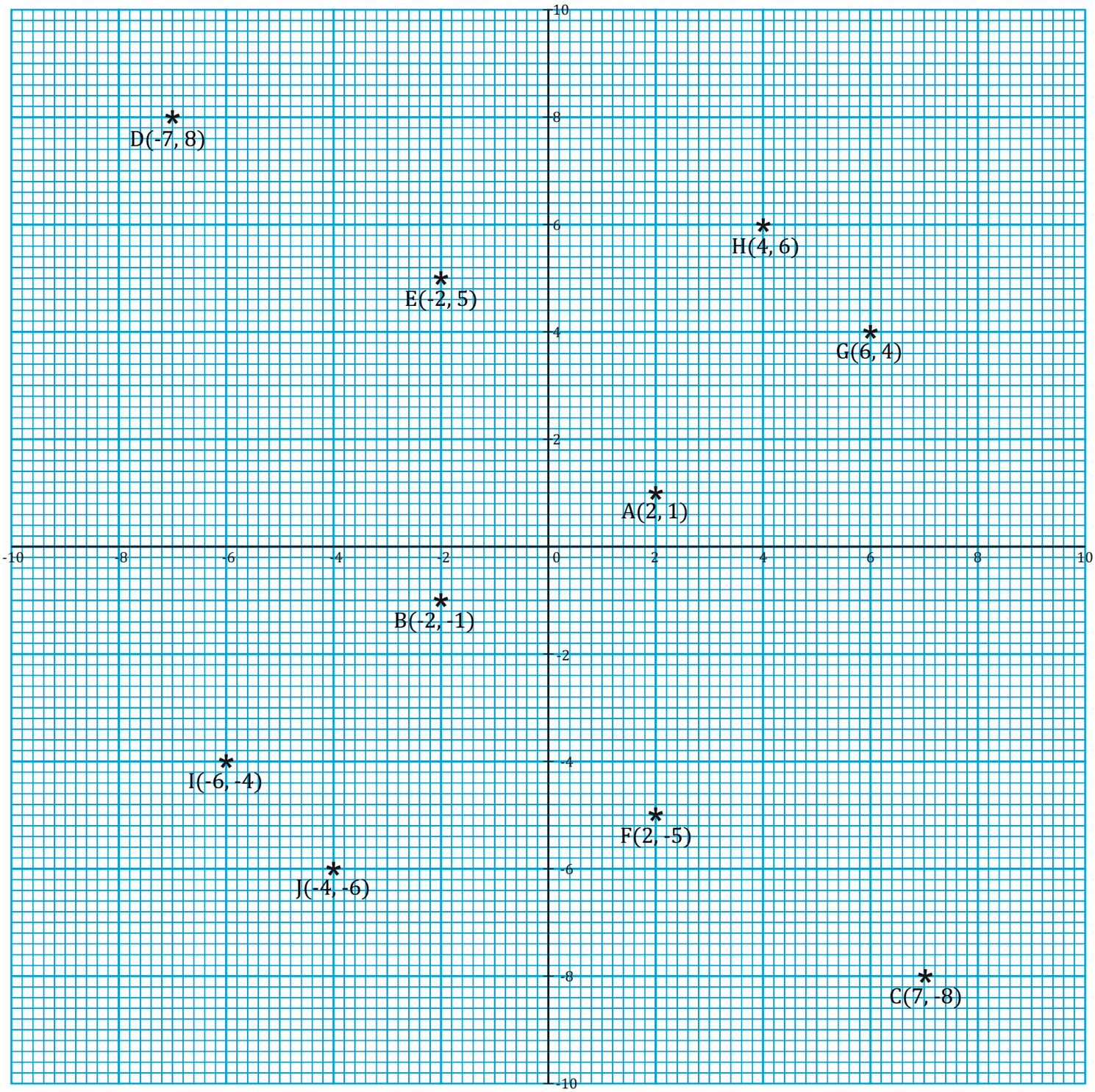
ACTIVITY 1.23

a) 76cm
b) 30cm
c) 10cm

ACTIVITY 1.24

i) 132m
ii) 272m
iii) $4326m^2$

ACTIVITY 1.25



ACTIVITY 1.26

A (1, 2)

B (-1, 8)

C (4, -4)

D (3, 12)

E (-2, -8)

UNIT 2

APPLICATION OF SETS

ACTIVITY 2.1

K = {1, 4, 8, 16, 25}
L = {12, 15, 18}
M = {2, 3, 5}
N = {1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72}
O = {1, 37}

ACTIVITY 2.2

i) Circle
ii) Mode
iii) Gabon
iv) Range
v) 9

ACTIVITY 2.3

A = {4, 6, 8, 9, 10, 12, 14, 15, 16, 18}
B = {January, March, May, July, August, Sept, October, December}
C = { }
D = {5, 7, 11, 13, 17, 19}
E = {2, 3, 5}

ACTIVITY 2.4

B = {20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30}

D = {1, 3, 7, 9, 21, 63}

i) B U D = {1, 2, 3, 5, 7, 9, 11, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 63}
ii) B ∩ D = {21}
iii) Unit set

ACTIVITY 2.5

i) A = {2, 3, 5, 7}
B = {1, 3, 5, 7, 9}
C = {3, 6, 9}
ii) A ∩ B = {3, 5, 7}
iii) A U B = {1, 2, 3, 5, 7, 9}

ACTIVITY 2.6

a) P = {1, 3, 5, 7, 9, 11, 13, 15}
Q = {3, 6, 9, 12, 15}
b) i) P∩Q = {3, 9, 15}
ii) P^{I}∩Q = {6, 12}
iii) $(P \cup Q)^{I}$ = {2, 4, 8, 10, 14}

ACTIVITY 2.7

i) A = {2, 4, 6, 8, 10, 12, 14}
ii) A only = {2, 4, 8, 10, 14}
iii) A∩B = {6, 12}
iv) $(A \cap B)^{I}$ = {1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 13, 14, 15}
v) $(A \cup B)^{I}$ = {1, 5, 7, 11, 13}

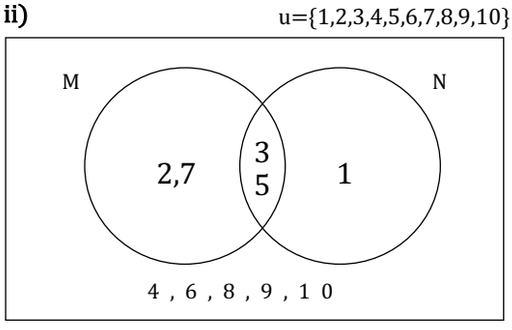
ACTIVITY 2.8

i) P^{I} = {1, 4}
ii) Q = {4}
iii) P∩Q = { }
iv) P∪Q = {2, 3, 4, 5}
v) $(P \cup Q)^{I}$ = {1}

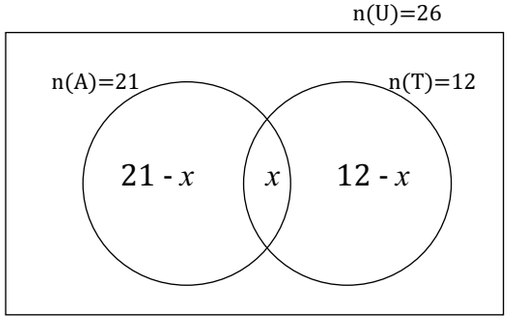
ACTIVITY 2.9

i) U = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
M = {2, 3, 5, 7}
N = {1, 3, 5}

ii)



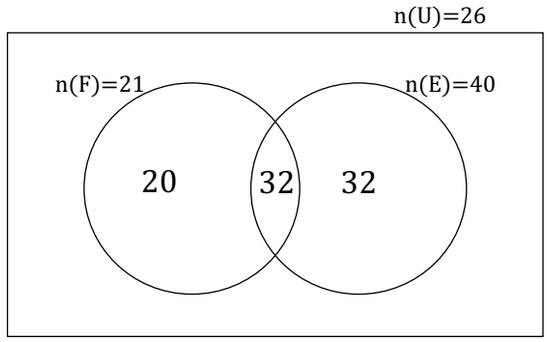
ACTIVITY 2.10



ACTIVITY 2.11

a) i) 32 pupils
ii) 8 pupils

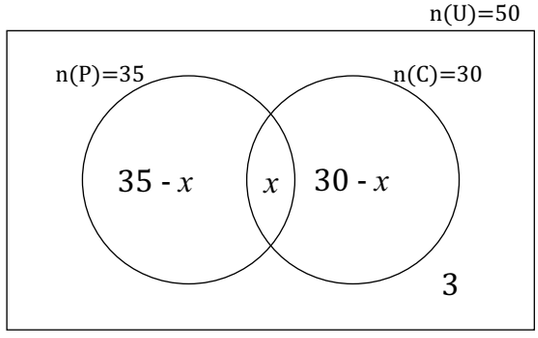
b)



ACTIVITY 2.12

a) i) 35 traders
ii) 18 traders
iii) 12 traders

b)



ACTIVITY 2.13

Subsets of A = {}, {1}
Subsets of B = {}, {2}, {3}, {5}, {2, 3}, {2, 5}, {3, 5}, {2, 3, 5}

ACTIVITY 2.14

Subsets of P = ∅, {a}, {b}, {c}, {a, b}, {a, c}, {b, c}, {a, b, c}
Subsets of Q = ∅, {x}, {y}, {x, y}

ACTIVITY 2.15

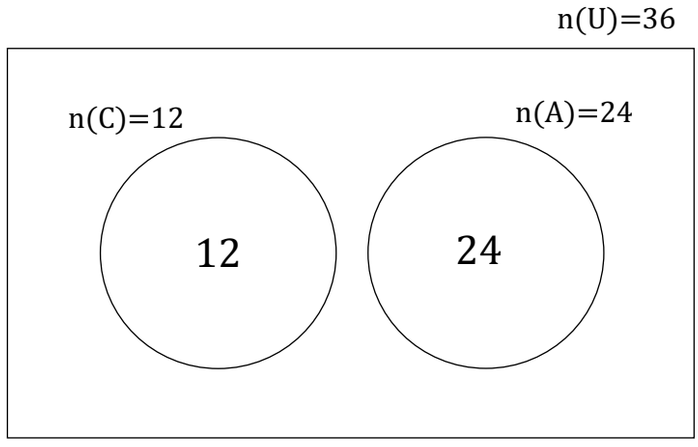
i) 16 Subsets
ii) 32 Subsets

ACTIVITY 2.16

i) 1 subset
ii) 64 subsets

ACTIVITY 2.17

i)



ii) $\frac{2}{3}$

iii) $\frac{11}{35}$

Test Your Understanding

1. Well-defined
2. Elements
3. Property
4. Venn diagrams
5. Rectangle
6. Within
7. Intersection
8. Belong to
9. Disjoint
10. Union
11. Complements
12. Subsets
13. 2^n
14. Empty set
15. Set
16. 2

RIGID MOTION

ACTIVITY 3.1

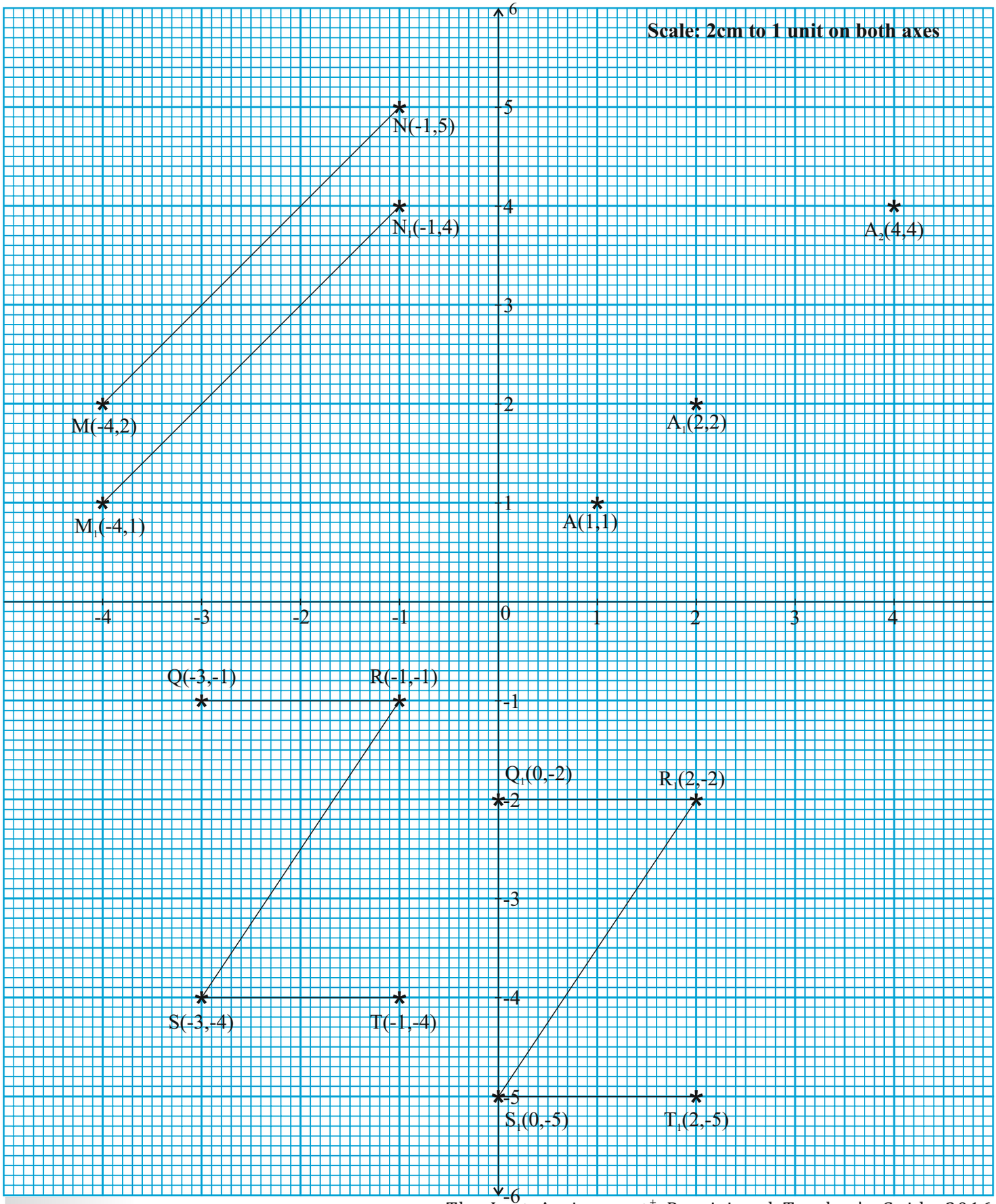
b) ii) $A_1\binom{2}{2}$

c) ii) Translation by the Vector $\binom{2}{2}$

d) ii) $M_1\binom{-4}{1}$; $N_1\binom{-1}{4}$

e) ii) $Q_1\binom{0}{-2}$; $R_1\binom{2}{-2}$; $S_1\binom{0}{-5}$; $T_1\binom{2}{-5}$

NOTES


Scale: 2cm to 1 unit on both axes
N(-1,5)
N1(-1,4)
A2(4,4)
M(-4,2)
A1(2,2)
M1(-4,1)
A(1,1)
Q(-3,-1)
R(-1,-1)
Q1(0,-2)
R1(2,-2)
S(-3,-4)
T(-1,-4)
S1(0,-5)
T1(2,-5)

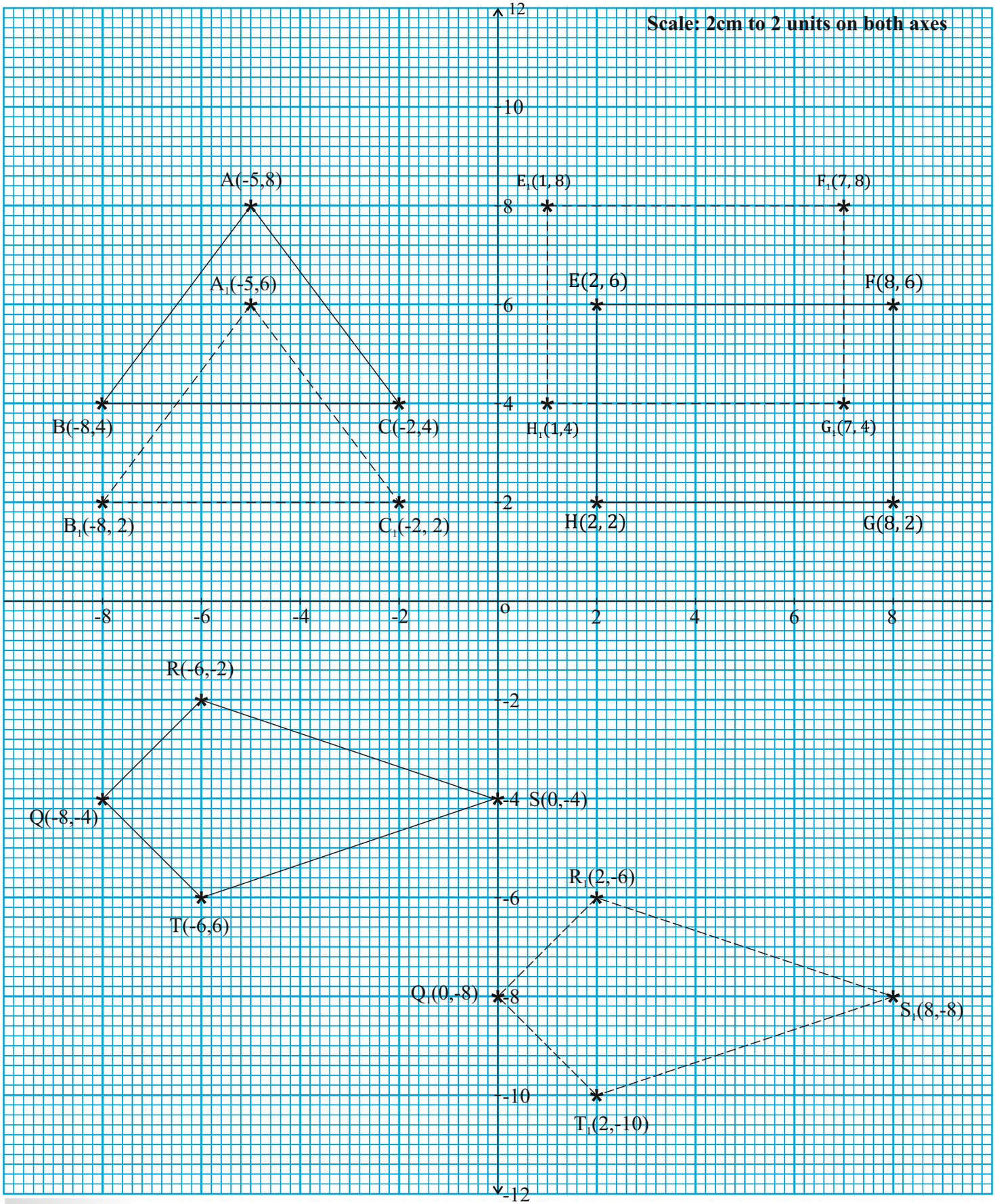
ACTIVITY 3.2

b) ii) $A_1\binom{-5}{6}$; $B_1\binom{-8}{2}$; $C_1\binom{-2}{2}$

c) ii) $E_1\binom{1}{8}$; $F_1\binom{7}{8}$; $G_1\binom{7}{4}$; $H_1\binom{1}{4}$

d) iii) Translation by the vector $\binom{-8}{4}$

NOTES


Scale: 2cm to 2 units on both axes
A(-5,8)
A1(-5,6)
B(-8,4)
C(-2,4)
B1(-8, 2)
C1(-2, 2)
E1(1, 8)
F1(7, 8)
E(2, 6)
F(8, 6)
H1(1,4)
G1(7, 4)
H(2, 2)
G(8, 2)
R(-6,-2)
Q(-8,-4)
S(0,-4)
T(-6,6)
R1(2,-6)
Q1(0,-8)
S1(8,-8)
T1(2,-10)

ACTIVITY 3.3

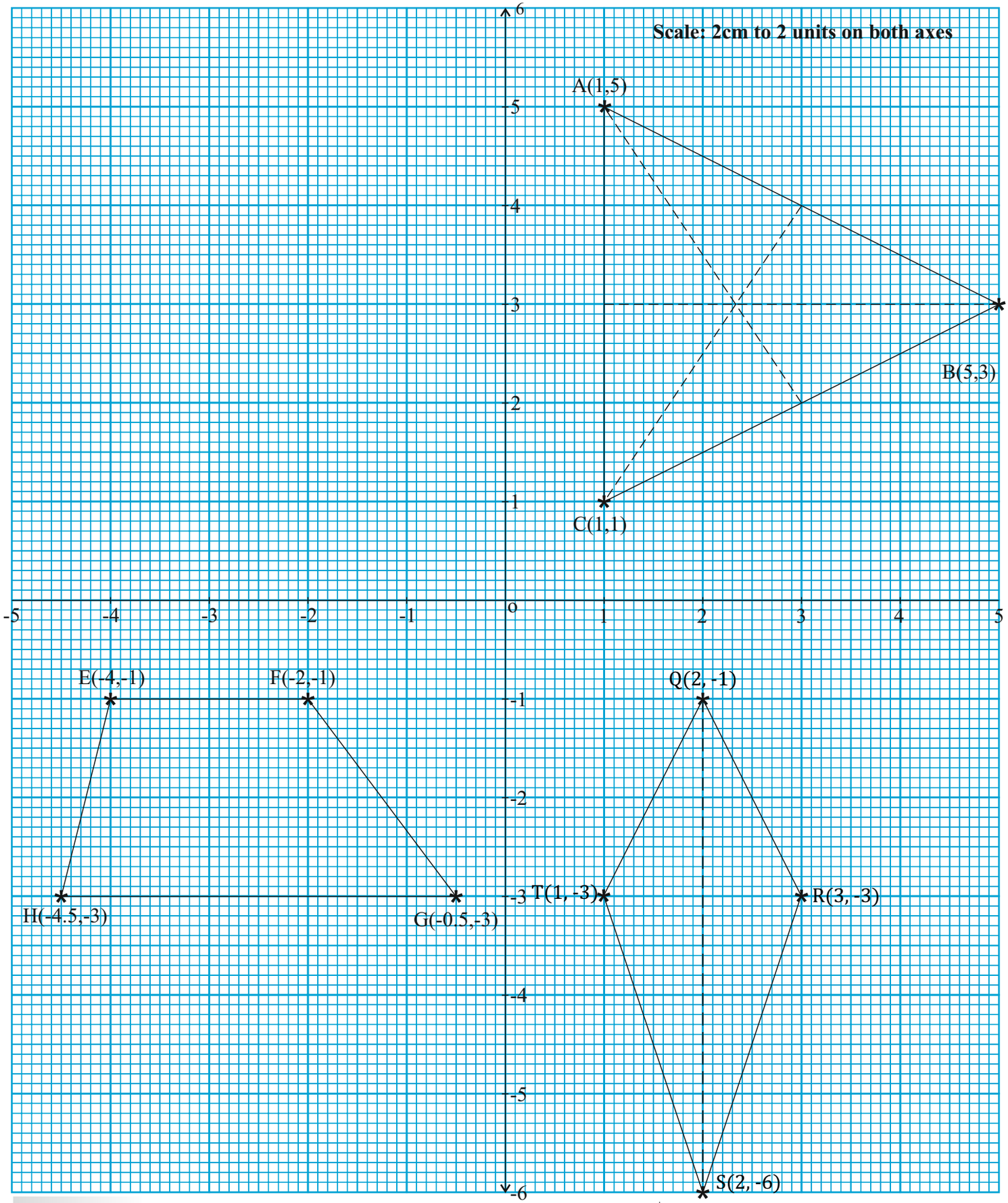
b) iii) The lines of symmetry of ΔABC trisect the ΔABC into equal parts.

c) iii) Trapezium

iv) EFGH has no line of symmetry.

d) iii) The line of symmetry of QRST bisect QRST.

NOTES


Scale: 2cm to 2 units on both axes
A(1,5)
B(5,3)
C(1,1)
E(-4,-1)
F(-2,-1)
Q(2,-1)
H(-4.5,-3)
G(-0.5,-3)
T(1,-3)
R(3,-3)
S(2,-6)

ACTIVITY 3.4

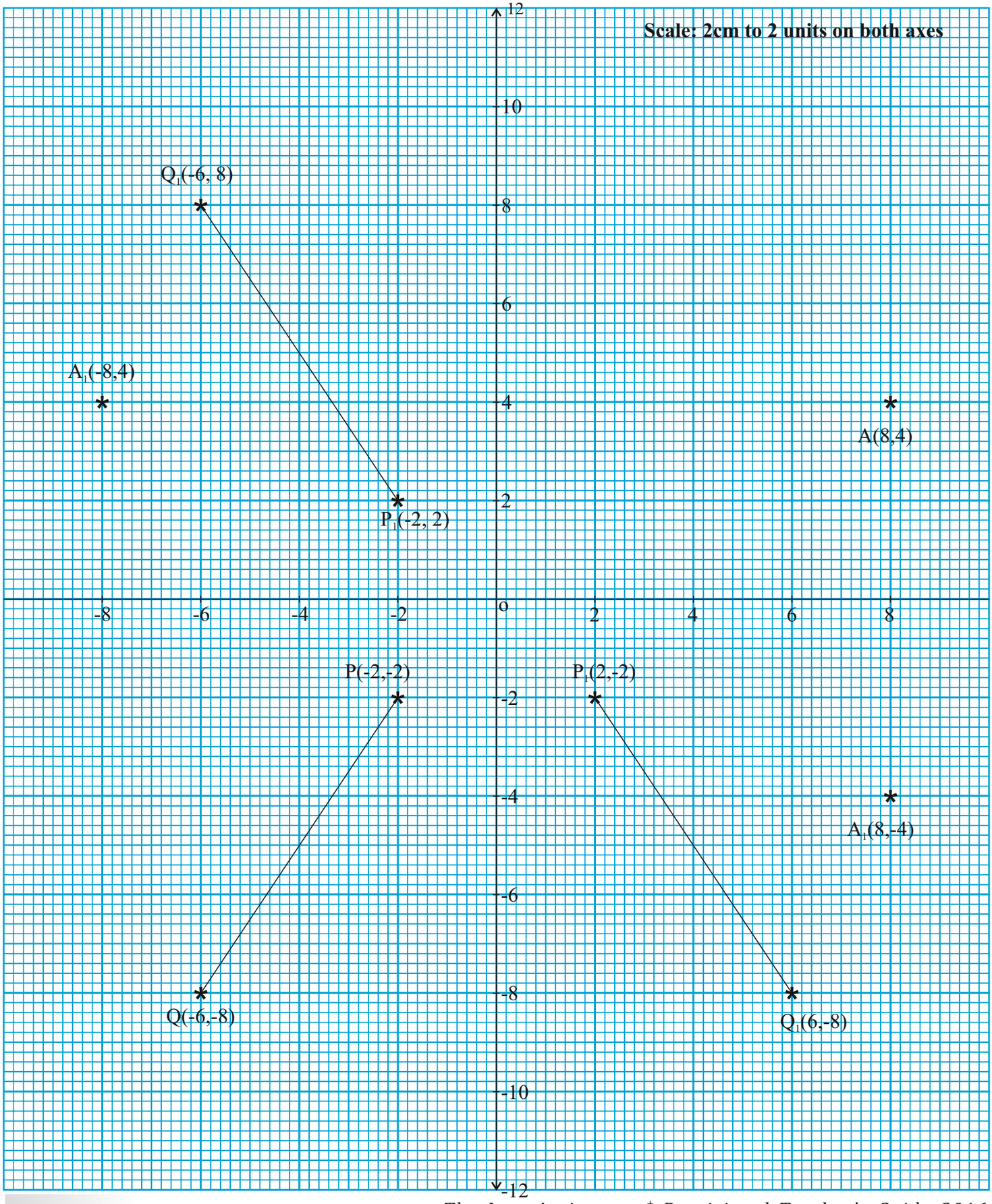
b) ii) $A_1\binom{8}{-4}$

iii) $A_2\binom{-8}{4}$

d) $P_1\binom{-2}{2}; Q_1\binom{-6}{8}$

e) $P_2\binom{2}{-2}; Q_2\binom{6}{-8}$

NOTES

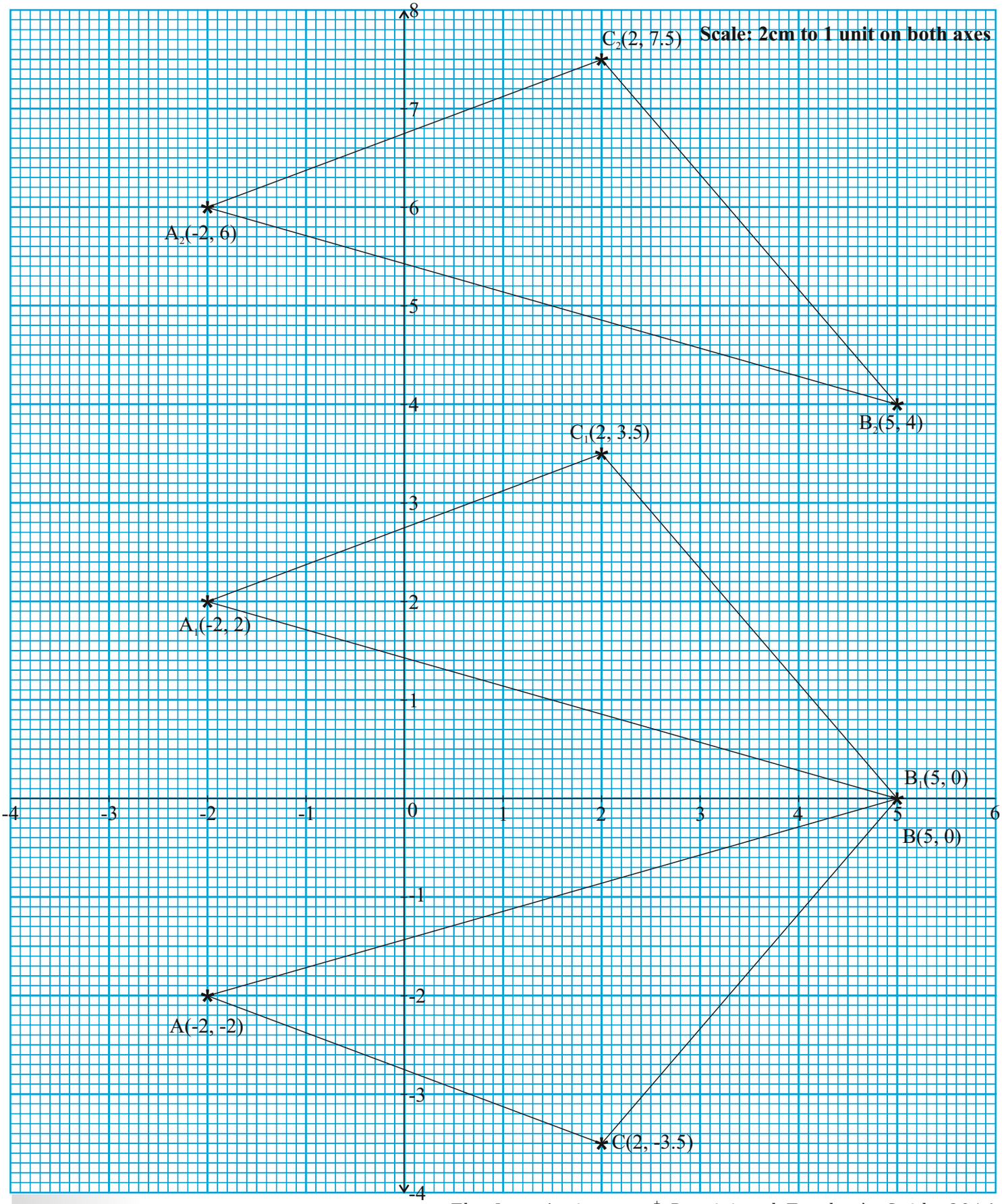

Scale: 2cm to 2 units on both axes
12
10
8
6
4
2
o
-2
-4
-6
-8
-10
-12
-8
-6
-4
-2
2
4
6
8
Q_1(-6, 8)
A_1(-8,4)
P_1(-2, 2)
A(8,4)
P(-2,-2)
P_1(2,-2)
A_1(8,-4)
Q(-6,-8)
Q_1(6,-8)

ACTIVITY 3.5

b) ii) $A_1\binom{-2}{2}$; $B_1\binom{5}{0}$; $C_1\binom{2}{3.5}$

c) $A_2\binom{-2}{6}$; $B_2\binom{5}{4}$; $C_2\binom{2}{7.5}$

NOTES

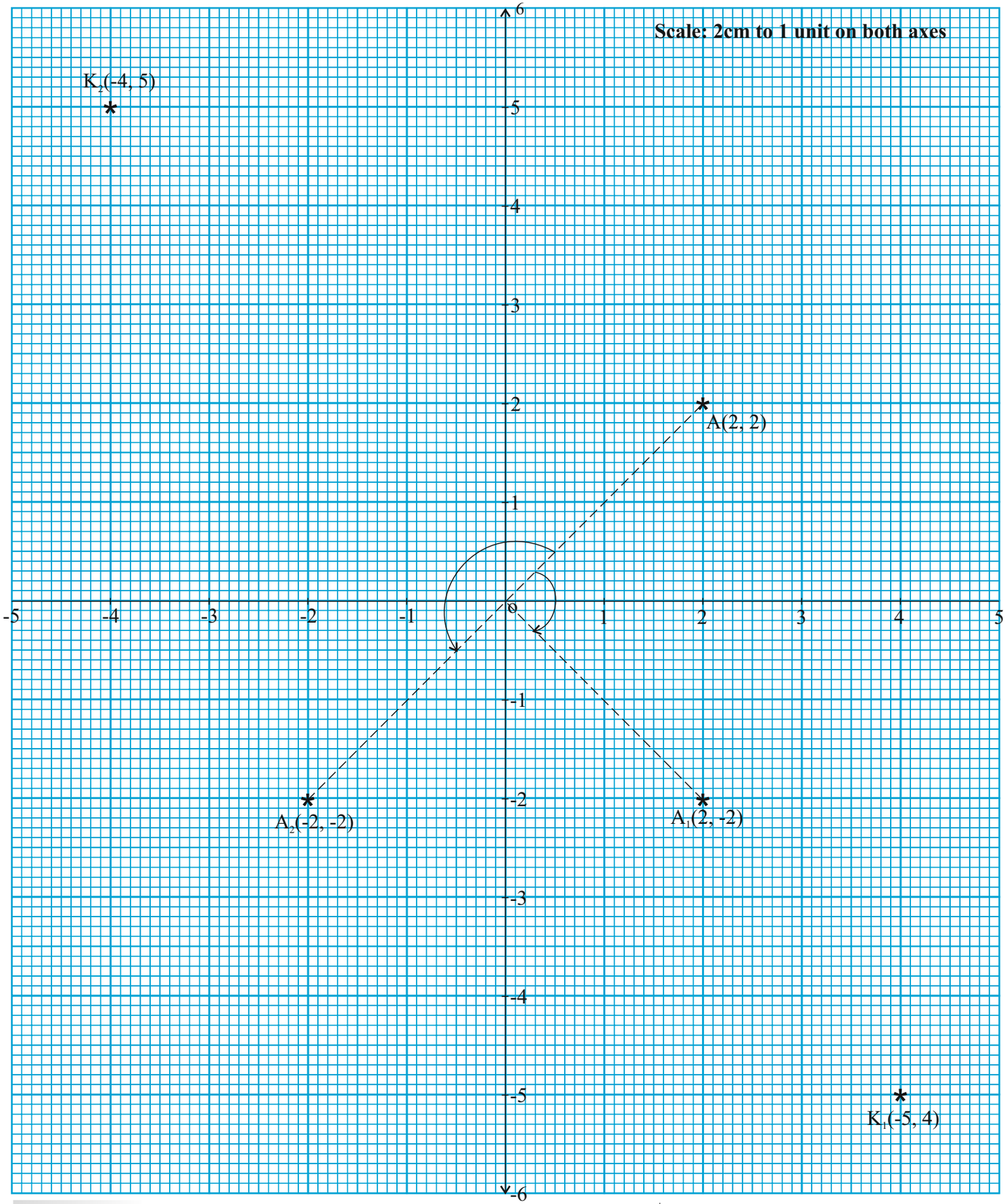

Scale: 2cm to 1 unit on both axes
C2(2, 7.5)
A2(-2, 6)
B2(5, 4)
C1(2, 3.5)
A1(-2, 2)
B1(5, 0)
B(5, 0)
A(-2, -2)
C(2, -3.5)

ACTIVITY 3.6

c) iii) $A_1\begin{pmatrix}2\\-2\end{pmatrix}$; $A_2\begin{pmatrix}-2\\-2\end{pmatrix}$

e) iii) $K_1\begin{pmatrix}5\\-4\end{pmatrix}$; $K_2\begin{pmatrix}-5\\4\end{pmatrix}$

NOTES


Scale: 2cm to 1 unit on both axes
K2(-4, 5)
A(2, 2)
A2(-2, -2)
A1(2, -2)
K1(-5, 4)
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-5
-4
-3
-2
-1
0
1
2
3
4
5

ACTIVITY 3.7

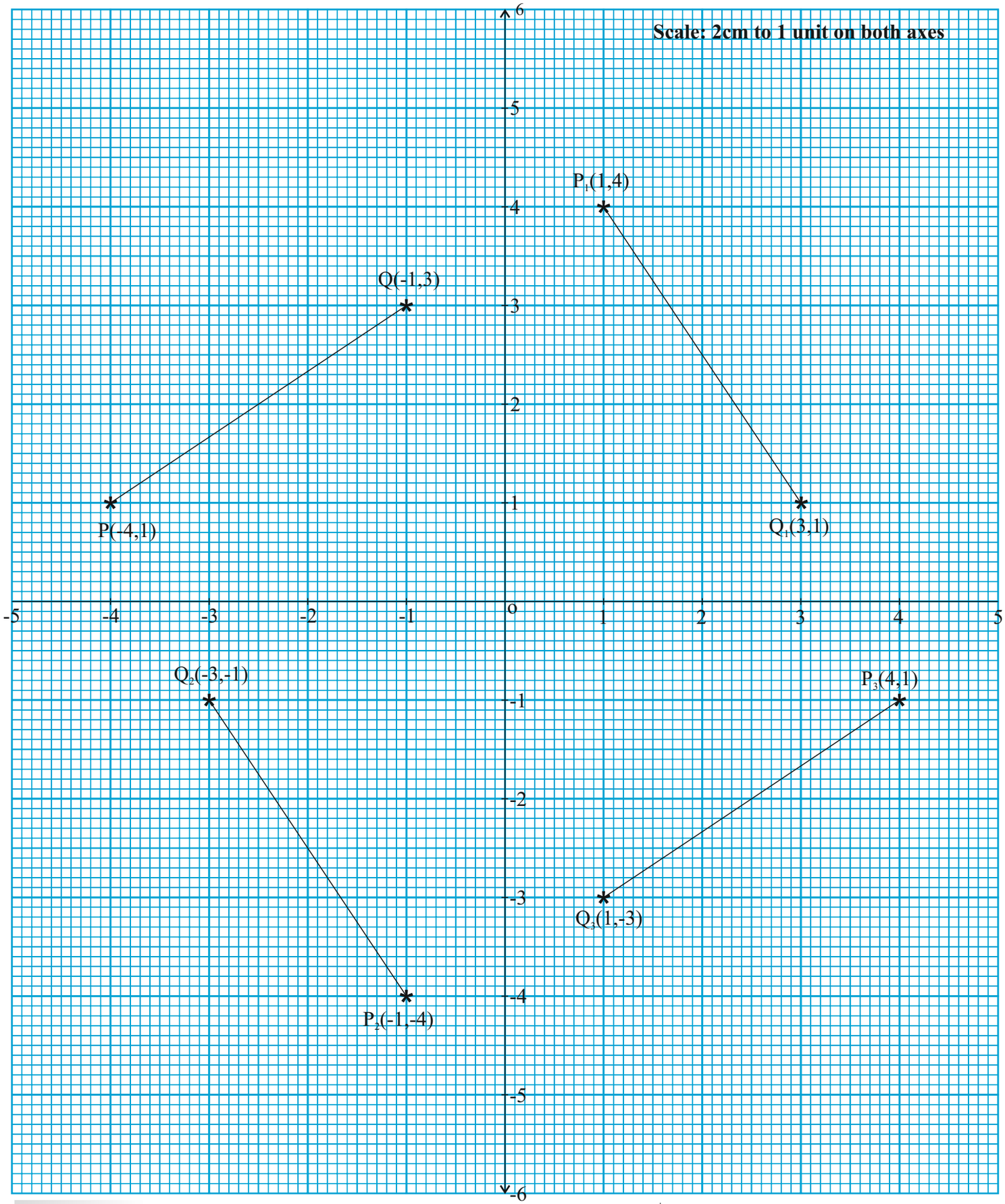
d) $P_1\binom{1}{4}$; $Q_1\binom{3}{1}$

e) $P_2\binom{-1}{-4}$; $Q_2\binom{-3}{-1}$

f) $P_3\binom{4}{-1}$; $Q_3\binom{1}{-3}$

g) An anticlockwise rotation of 180° about the origin.

NOTES


Scale: 2cm to 1 unit on both axes
P1(1,4)
Q(-1,3)
P(-4,1)
Q1(3,1)
Q2(-3,-1)
P3(4,1)
P2(-1,-4)
Q3(1,-3)
6
5
4
3
2
1
o
-1
-2
-3
-4
-5
-6
-5
-4
-3
-2
-1
1
2
3
4
5

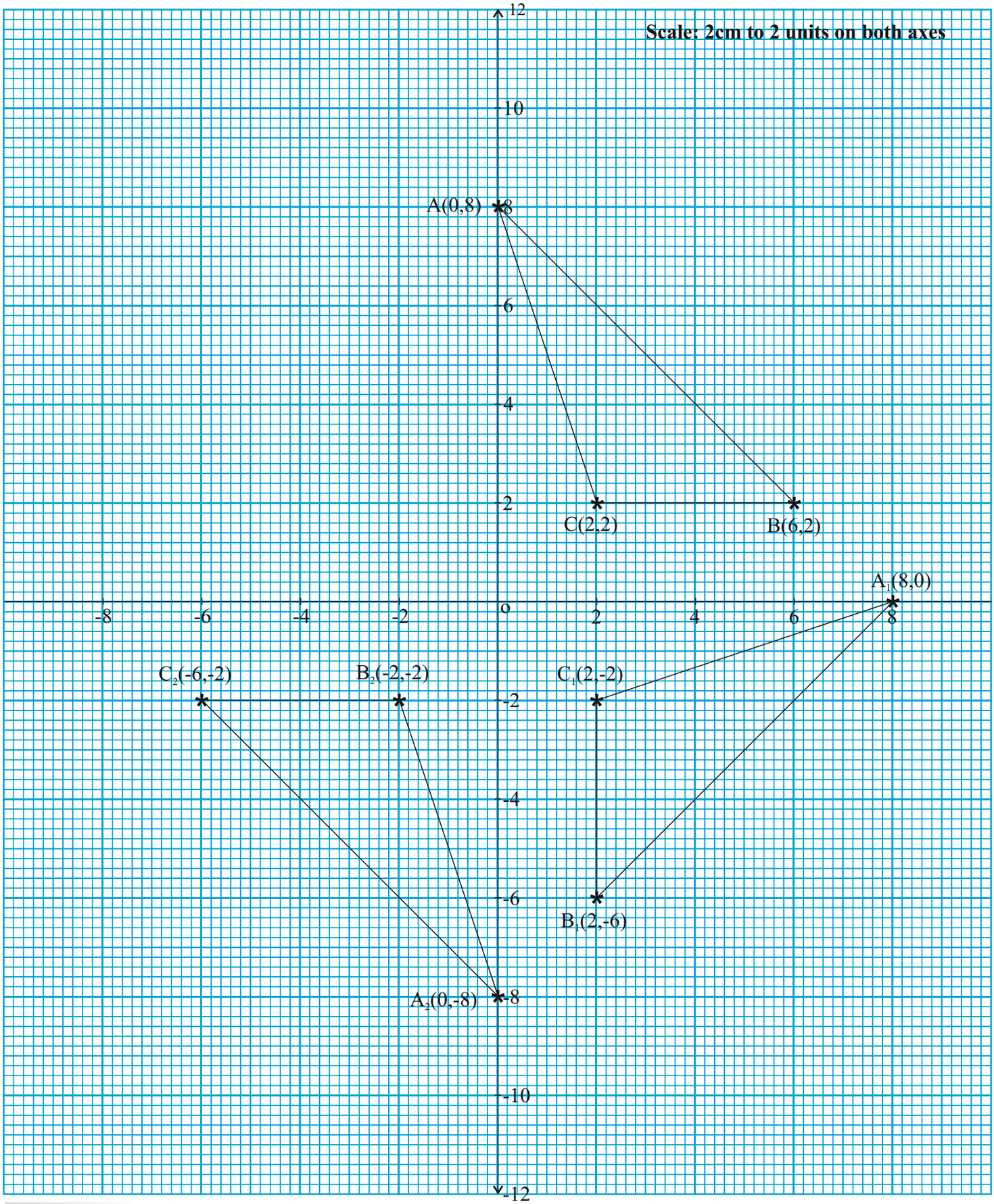
ACTIVITY 3.8

d) $A_1\binom{8}{0}$; $B_1\binom{2}{-6}$; $C_1\binom{2}{-2}$

e) $A_2\binom{0}{-8}$; $B_2\binom{-6}{-2}$; $C_2\binom{-2}{-2}$

f) A clockwise rotation of 90° about the origin.

NOTES


Scale: 2cm to 2 units on both axes
12
10
8
6
4
2
o
-2
-4
-6
-8
-10
-12
-8
-6
-4
-2
2
4
6
8
A(0,8)
C(2,2)
B(6,2)
A1(8,0)
C2(-6,-2)
B2(-2,-2)
C1(2,-2)
B1(2,-6)
A2(0,-8)

ACTIVITY 3.9

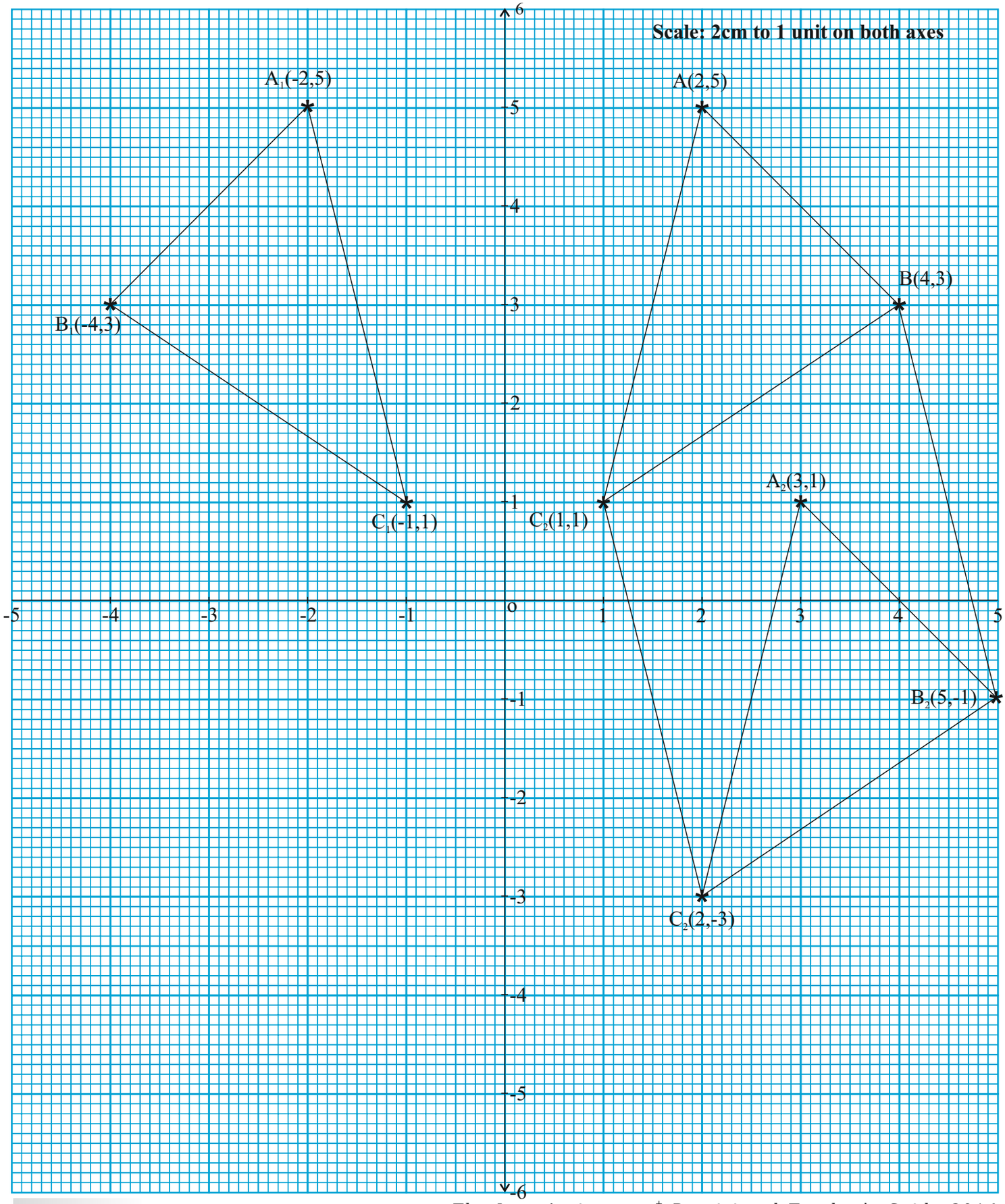
c) $A_1\binom{-2}{5}$; $B_1\binom{-4}{3}$; $C_1\binom{-1}{1}$

d) $A_2\binom{3}{1}$; $B_1\binom{5}{-1}$; $C_1\binom{2}{-3}$

e) Parallelogram

f) $\binom{-2}{-2}$

NOTES


Scale: 2cm to 1 unit on both axes
A1(-2,5)
B1(-4,3)
C1(-1,1)
A(2,5)
B(4,3)
A2(3,1)
C2(1,1)
B2(5,-1)
C2(2,-3)
6
5
4
3
2
1
o
-1
-2
-3
-4
-5
-6
-5
-4
-3
-2
-1
1
2
3
4
5

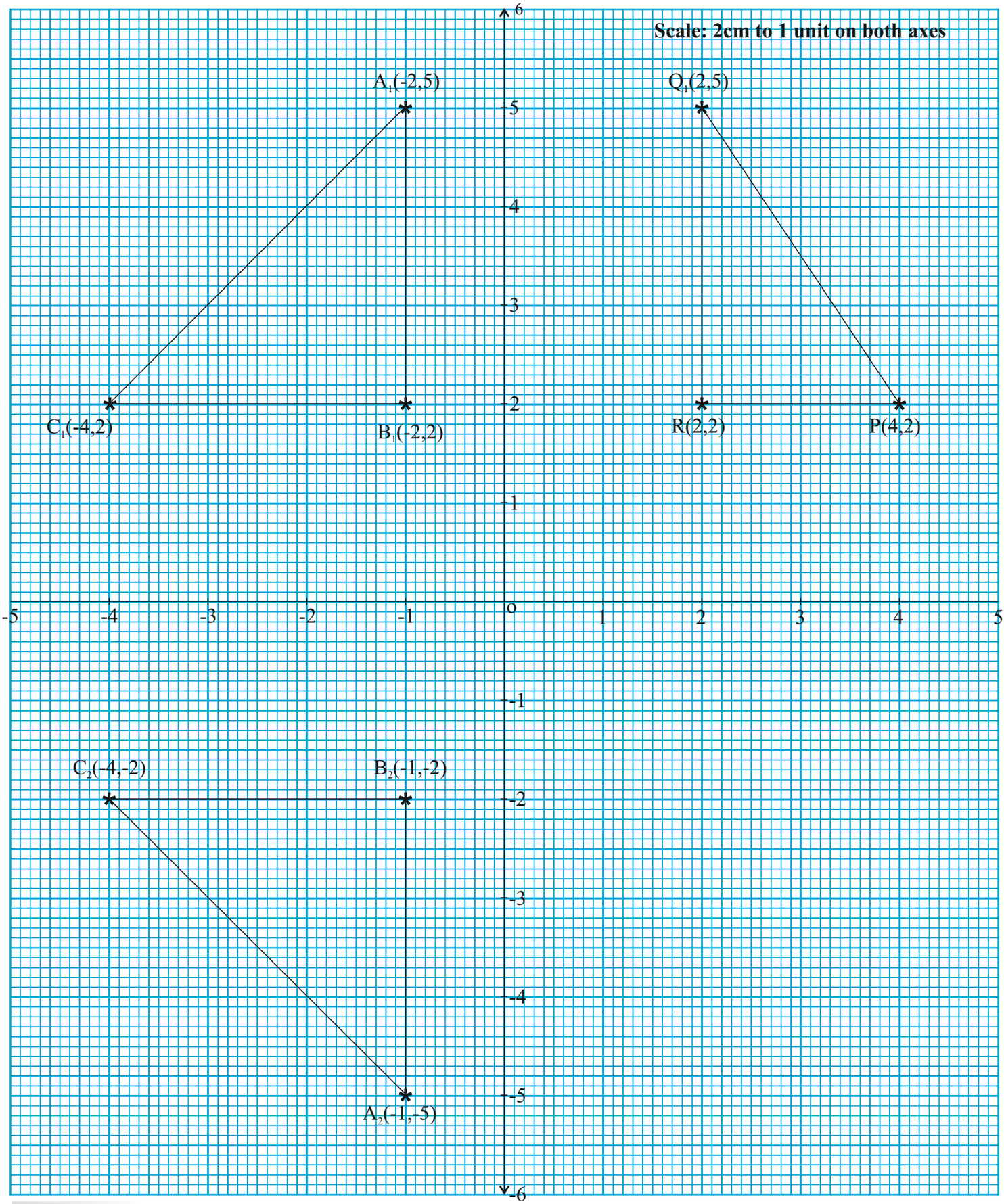
ACTIVITY 3.10

f) $P_1\binom{4}{-2}$; $Q_1\binom{2}{-5}$; $R_1\binom{2}{-2}$

vii) $P_2\binom{3}{1}$; $Q_2\binom{1}{4}$; $R_2\binom{1}{1}$

viii) $P_3\binom{-4}{-2}$; $Q_3\binom{-2}{-5}$; $R_3\binom{-2}{-2}$

NOTES


Scale: 2cm to 1 unit on both axes
A1(-2,5)
Q1(2,5)
C1(-4,2)
B1(-2,2)
R(2,2)
P(4,2)
C2(-4,-2)
B2(-1,-2)
A2(-1,-5)
6
5
4
3
2
1
o
-1
-2
-3
-4
-5
-6
-5
-4
-3
-2
-1
1
2
3
4
5

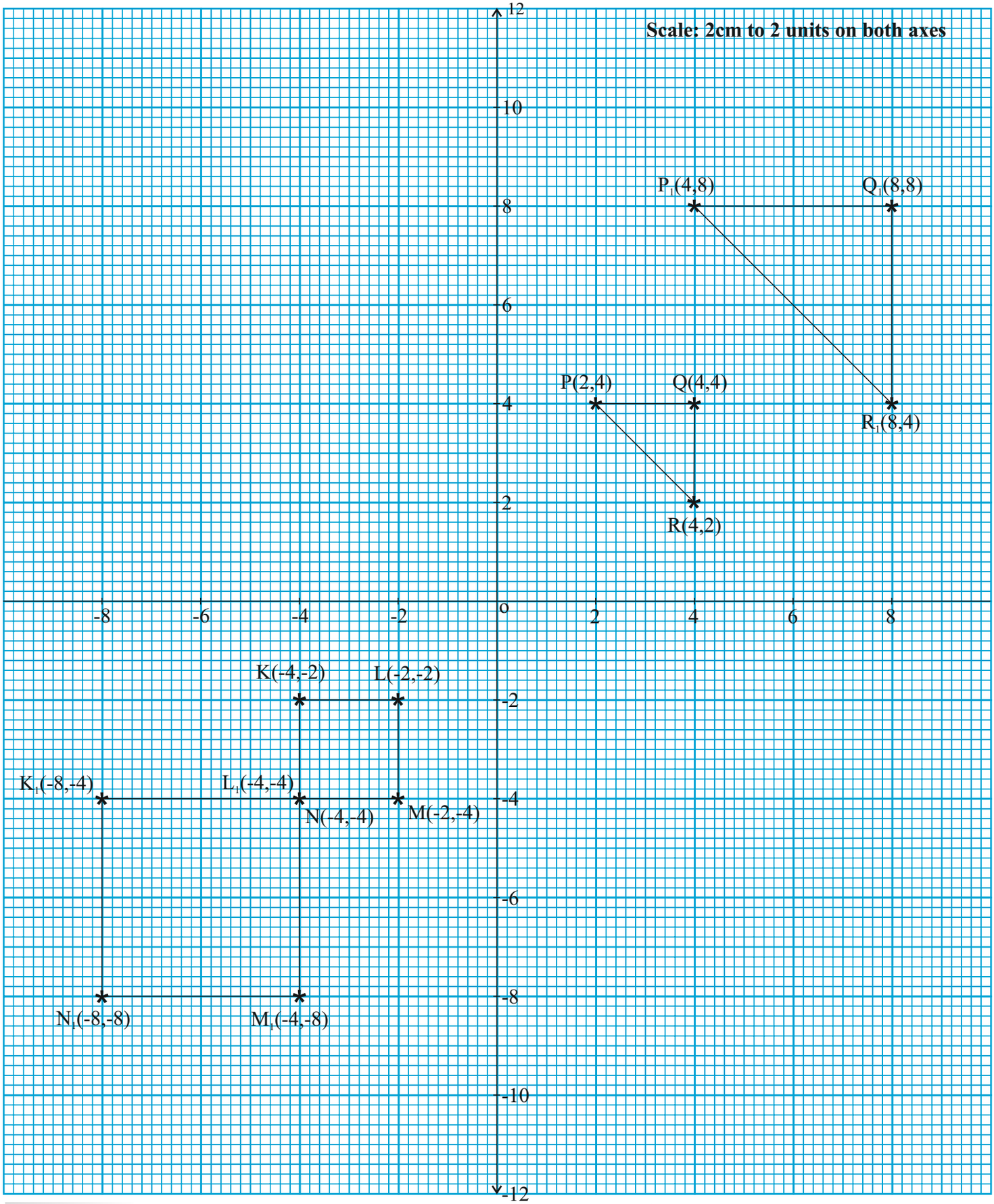
ENLARGEMENTS AND SIMILARITIES

ACTIVITY 4.1

c) iii) $P_1\binom{4}{8}$; $Q_1\binom{8}{8}$; $R_1\binom{8}{4}$

d) iii) $K_1\binom{-8}{-4}$; $L_1\binom{-4}{-4}$; $M_1\binom{-4}{-8}$; $M_1\binom{-8}{-8}$

NOTES

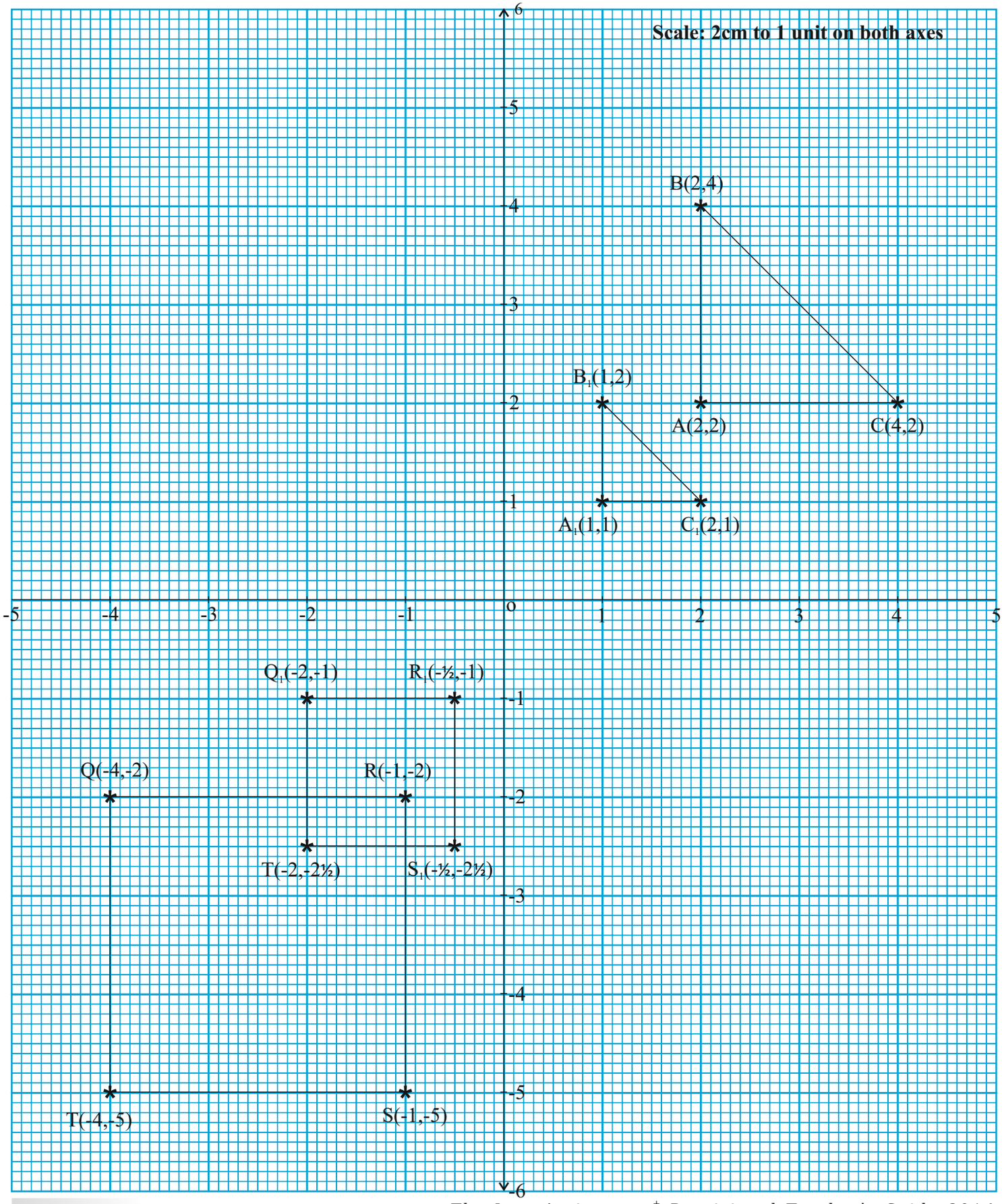

Scale: 2cm to 2 units on both axes
12
10
8
6
4
2
o
-2
-4
-6
-8
-10
-12
-8
-6
-4
-2
2
4
6
8
P1(4,8)
Q1(8,8)
P(2,4)
Q(4,4)
R1(8,4)
R(4,2)
K(-4,-2)
L(-2,-2)
K1(-8,-4)
L1(-4,-4)
N(-4,-4)
M(-2,-4)
N1(-8,-8)
M1(-4,-8)

ACTIVITY 4.2

c) iii) $A_1\binom{1}{1}$; $B_1\binom{1}{2}$; $C_1\binom{2}{1}$

d) iii) $Q_1\binom{-2}{-1}$; $R_1\binom{-½}{-1}$; $S_1\binom{-½}{-2½}$; $T_1\binom{-2}{-2½}$

NOTES

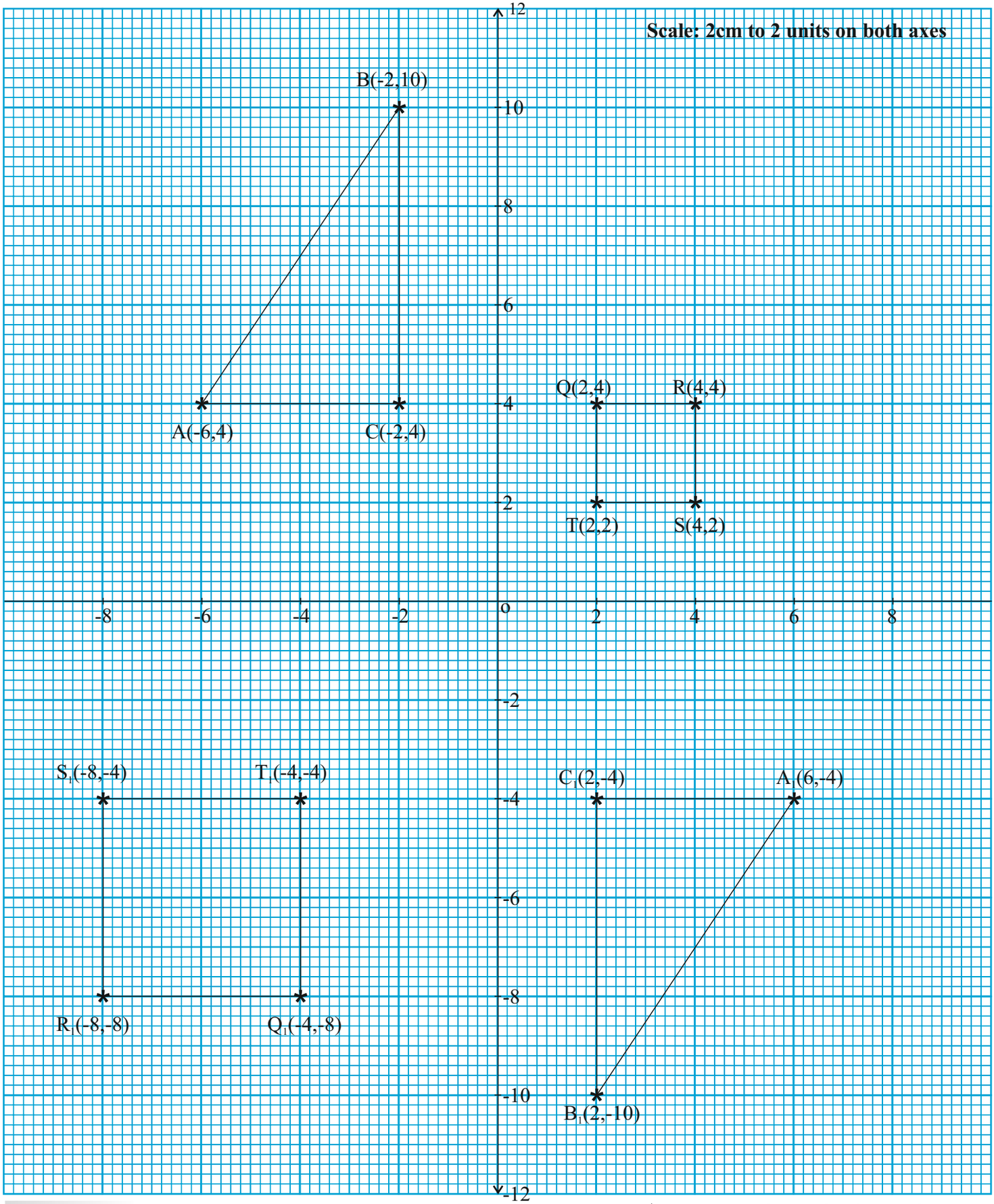

Scale: 2cm to 1 unit on both axes
B(2,4)
B1(1,2)
A(2,2)
C(4,2)
A1(1,1)
C1(2,1)
Q1(-2,-1)
R1(-½,-1)
Q(-4,-2)
R(-1,-2)
T(-2,-2½)
S1(-½,-2½)
T(-4,-5)
S(-1,-5)

ACTIVITY 4.3

c) iii) $A_1\binom{6}{-4}$; $B_1\binom{2}{-10}$; $C_1\binom{2}{-4}$

d) iii) $Q_1\binom{-4}{-8}$; $R_1\binom{-8}{-8}$; $S_1\binom{-8}{-4}$; $T_1\binom{-4}{-4}$

NOTES


Scale: 2cm to 2 units on both axes
B(-2,10)
A(-6,4)
C(-2,4)
Q(2,4)
R(4,4)
T(2,2)
S(4,2)
S1(-8,-4)
T1(-4,-4)
R1(-8,-8)
Q1(-4,-8)
C1(2,-4)
A1(6,-4)
B1(2,-10)
12
10
8
6
4
2
o
-2
-4
-6
-8
-10
-12
-8
-6
-4
-2
2
4
6
8

ACTIVITY 4.4

a) i) $\binom{-6}{10}$; $\binom{-2}{10}$; $\binom{-4}{6}$
ii) $\binom{6}{-10}$;$\binom{2}{-10}$; $\binom{4}{-6}$

b) Scale factor = -1
c) Enlargement by the scale factor ½
d) Enlargement by the scale factor 2

ACTIVITY 4.5

a) i) -2
ii) 9cm

b) i) 3
ii) 7.2cm

ACTIVITY 4.6

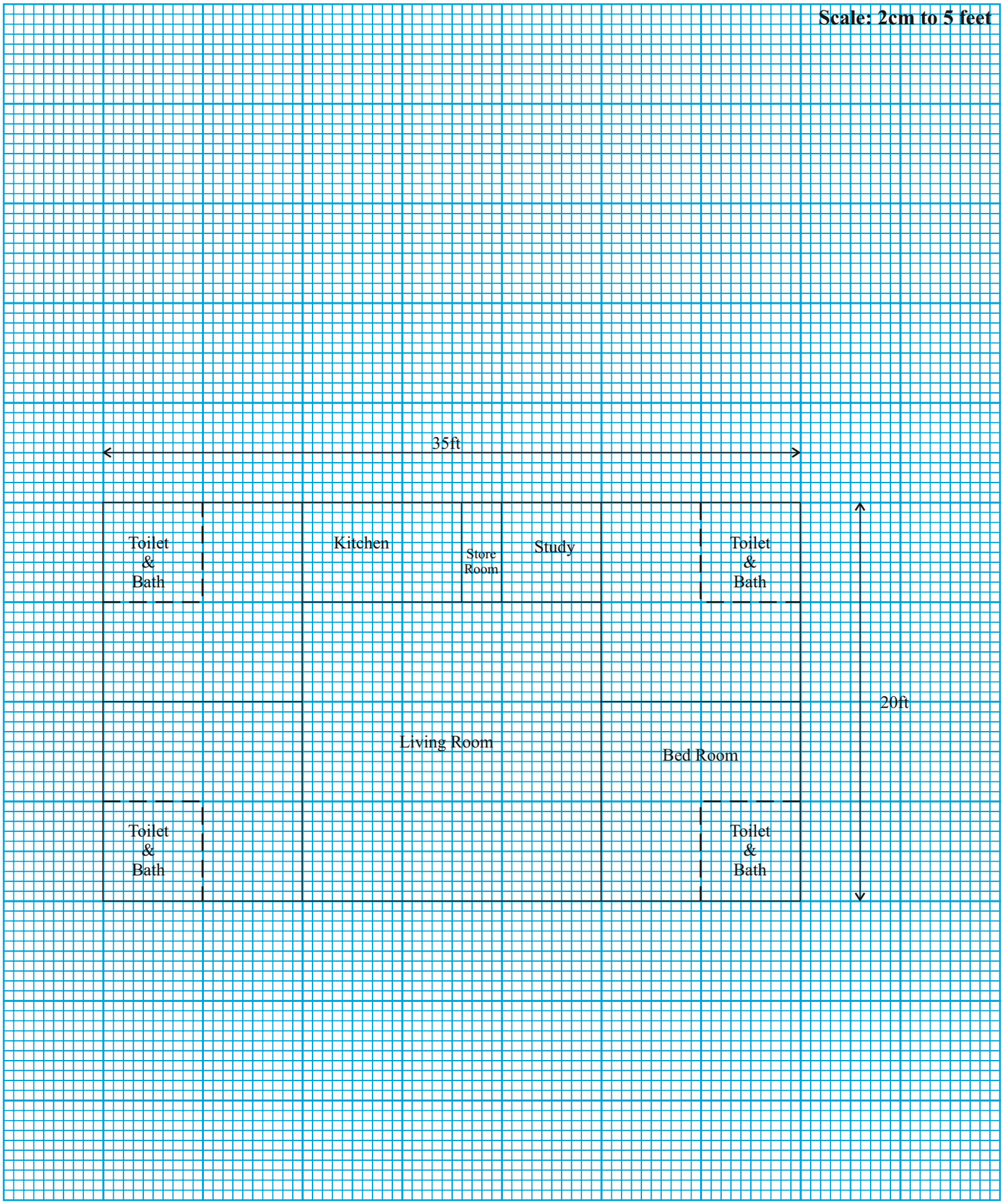
a) 1.5
b) i) 1.5
c) ii) 7.5

ACTIVITY 4.7

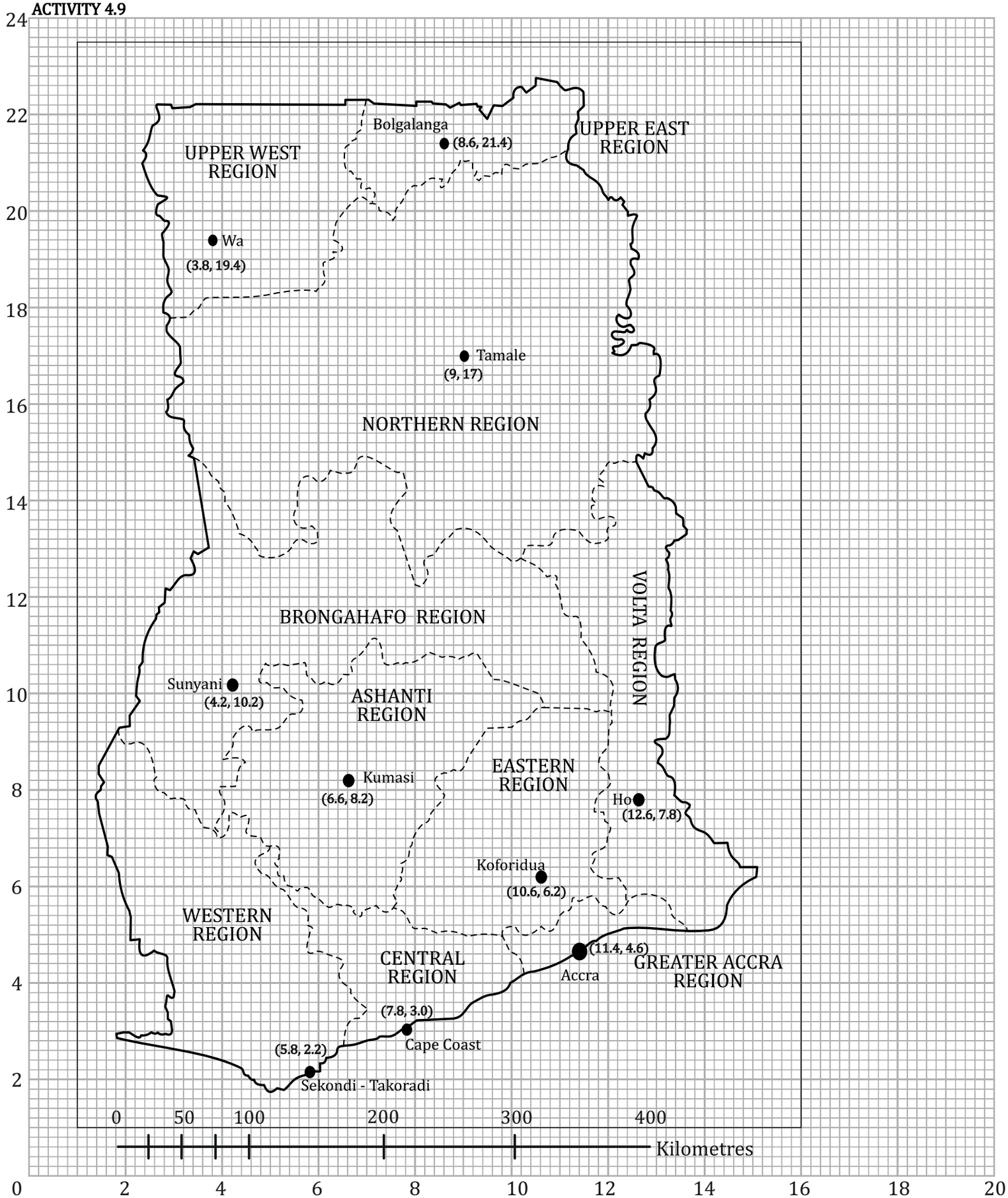
1. a = 9cm; b = 30cm
2. i) 4
ii) 6cm

ACTIVITY 4.8

i) 2.5ft × 5ft
ii) 255ft^2


Scale: 2cm to 5 feet
35ft
20ft
Toilet & Bath
Kitchen
Store Room
Study
Toilet & Bath
Living Room
Bed Room
Toilet & Bath
Toilet & Bath

ACTIVITY 4.9


UPPER WEST REGION
Bolgalanga
(8.6, 21.4)
UPPER EAST REGION
Wa
(3.8, 19.4)
Tamale
(9, 17)
NORTHERN REGION
VOLTA REGION
BRONGAHAFO REGION
Sunyani
(4.2, 10.2)
ASHANTI REGION
EASTERN REGION
Kumasi
(6.6, 8.2)
Ho
(12.6, 7.8)
Koforidua
(10.6, 6.2)
WESTERN REGION
CENTRAL REGION
(11.4, 4.6)
Accra
GREATER ACCRA REGION
(7.8, 3.0)
Cape Coast
(5.8, 2.2)
Sekondi - Takoradi
0 50 100 200 300 400
Kilometres
0 2 4 6 8 10 12 14 16 18 20
2 4 6 8 10 12 14 16 18 20 22 24

ACTIVITY 4.10

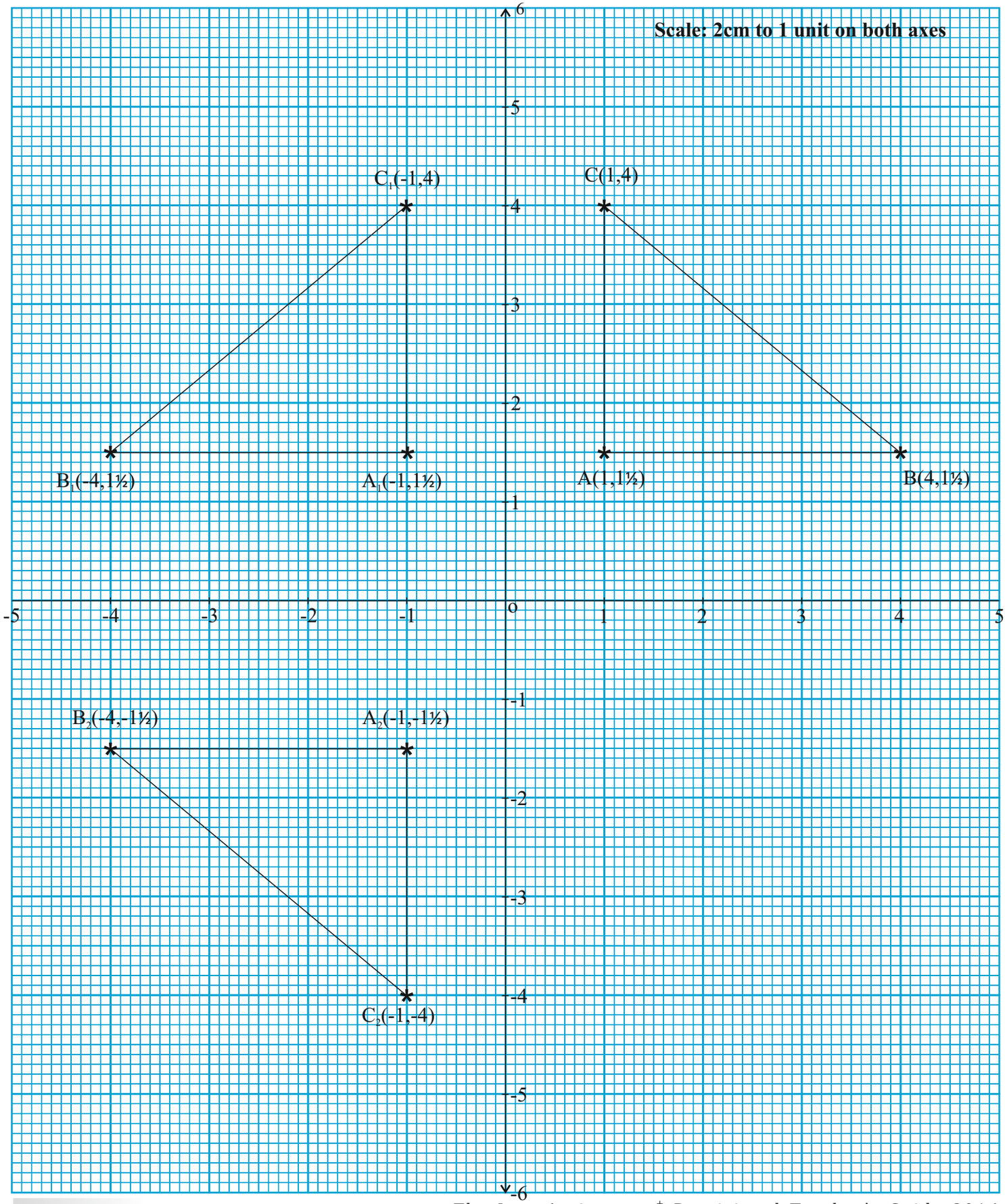
c) ii) Right angled triangle

d) $A_1\binom{-1}{1\frac{1}{2}}$; $B_1\binom{-4}{1\frac{1}{2}}$; $C_1\binom{-1}{4}$

e) $A_2\binom{-1}{-1\frac{1}{2}}$; $B_1\binom{-4}{-1\frac{1}{2}}$; $C_1\binom{-1}{-4}$

f) Reflection in the line $y = 0$ / x - axis

NOTES

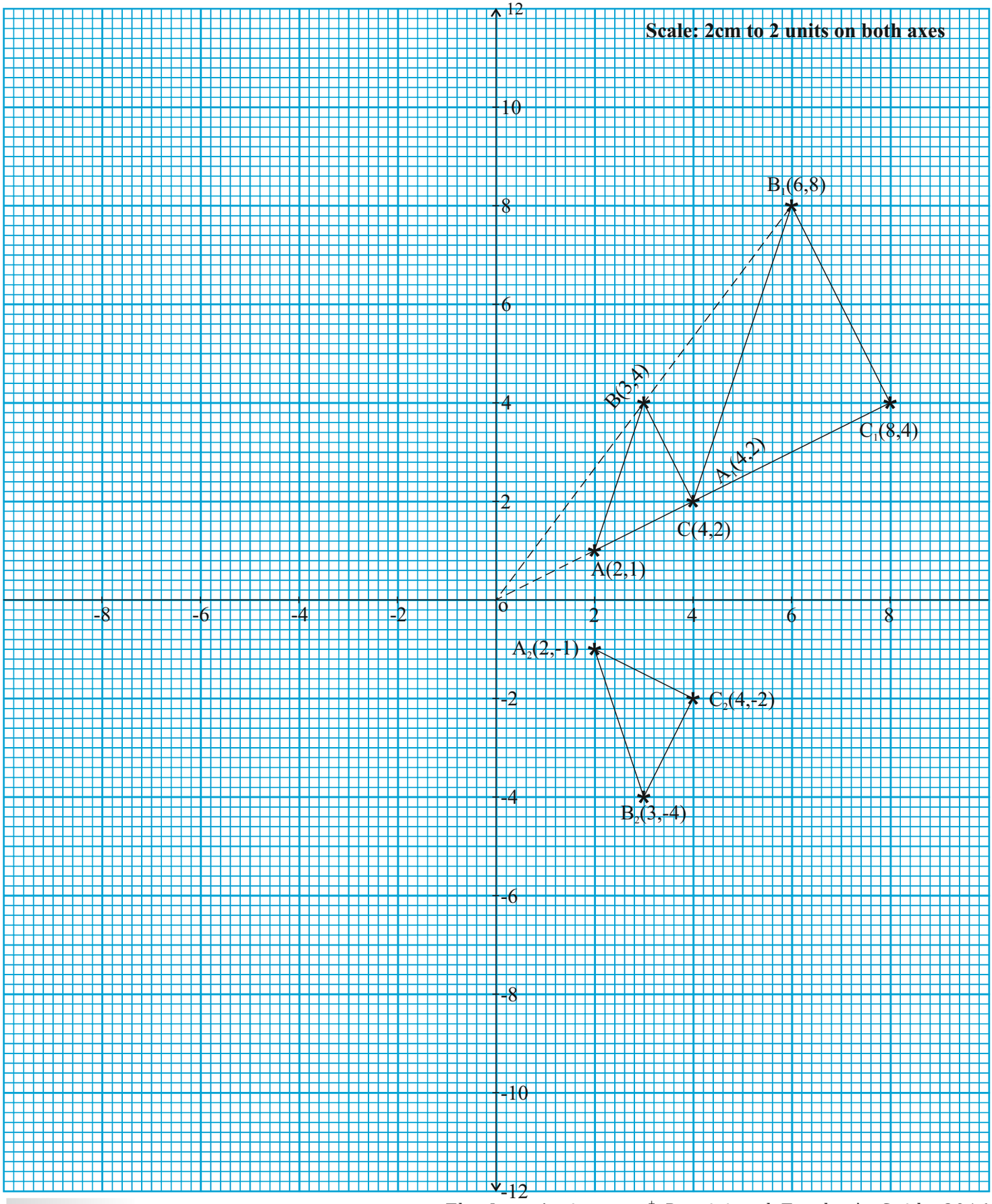

Scale: 2cm to 1 unit on both axes
C1(-1,4)
C(1,4)
B1(-4,1½)
A1(-1,1½)
A(1,1½)
B(4,1½)
B2(-4,-1½)
A2(-1,-1½)
C2(-1,-4)

ACTIVITY 4.11

d) $A_1\binom{4}{2}$; $B_1\binom{6}{8}$; $C_1\binom{8}{4}$

e) $A_2\binom{2}{-1}$; $B_1\binom{3}{-4}$; $C_1\binom{4}{-2}$

NOTES


Scale: 2cm to 2 units on both axes
12
10
8
6
4
2
-2
-4
-6
-8
-10
-12
-8
-6
-4
-2
O
2
4
6
8
B1(6,8)
B(3,4)
C1(8,4)
A1(4,2)
C(4,2)
A(2,1)
A2(2,-1)
C2(4,-2)
B2(3,-4)

UNIT 5

HANDLING DATA AND PROBABILITY

ACTIVITY 5.1

i) 150cm
ii) 174cm
iii) 24cm
iv) 159cm
v) 159cm

ACTIVITY 5.2

i) 9 years
ii) 8 years
iii) 11 years
iv) 11 years
v) 12 years

ACTIVITY 5.3

a) ii) 6
b) 5

ACTIVITY 5.4

a) Completing the table

Game	Tally	Frequency
FIFA	𝍸 𝍸 𝍸 ////	19
Assassins Creed	///	**3**
Mortal Combat X	𝍸 𝍸 ///	13
Call of Duty	𝍸 𝍸 𝍸	**15**
God of War	𝍸 𝍸	**10**
	Total	60

b) Call of duty
c) FIFA

ACTIVITY 5.5

a) Equally likely
b) Impossible
c) Certain
d) Likely
e) Equally likely
f) Unlikely
g) Very likely
h) Impossible
i) Certain
j) Impossible

ACTIVITY 5.6

a) i) {1, 2, 3, 4, 5, 6}
ii) {1, 3}
iii) $\frac{1}{3}$

b) $\frac{1}{3}$
c) $\frac{5}{26}$

ACTIVITY 5.7

a) $\frac{7}{10}$
b) 21
c) $\frac{7}{10}$

ACTIVITY 5.8

i) {1, 2, 3, 4, 5, 6}
ii) $\frac{1}{2}$
iii) $\frac{1}{2}$

ACTIVITY 5.9

i) $\frac{6}{25}$
ii) $\frac{16}{25}$
iii) $\frac{9}{25}$
iv) $\frac{3}{25}$

ACTIVITY 5.10

a) 20
b) 8
c) 6.6
d) 10
e) $\frac{1}{20}$

ACTIVITY 5.11

i) 7
ii) 5
iii) 9
iv) 55%
v) $\frac{9}{20}$

Test Your Understanding

1) Minimum
2) Maximum
3) Range
4) Mode
5) median
6) Mean
7) Probability
8) Probability terms
9) Relative frequency
10) fraction

MONEY AND TAXES

ACTIVITY 6.1

1. GH₵330.00

2. a) GH₵57.60
b) GH₵230.40

ACTIVITY 6.2

1. a) GH₵95.00
b) GH₵15.83
c) GH₵1.85

2. a) GH₵7,200.00
b) GH₵86,400.00

ACTIVITY 6.3

a) GH₵278.40

b) GH₵260.00

ACTIVITY 6.4

1) a) i) GH₵200.00
ii) GH₵1000.00

b) i) GH₵250.00
ii) $31\frac{1}{4}\%$

2) a) i) GH₵22.50
ii) GH₵202.50
iii) GH₵16.88

b) GH₵217.50

ACTIVITY 6.5

a) GH₵1,440.00

b) $R = \frac{100I}{PT}$

c) 20%

ACTIVITY 6.6

a) GH₵5,600.00

b) GH₵630.00

ACTIVITY 6.7

a) GH₵12,000.00

b) GH₵80,000.00

ACTIVITY 6.8

a) 18%

b) 14.29%

ACTIVITY 6.9

i) Annual income tax for Kwaku is zero or no income tax.

ii) Annual income tax for Ali;

Remaining income GH₵	Amount to be taxed GH₵	Rate of tax	Tax paid (GH₵)
2400	1584	free	0
$2400 - 1584 = 816$	792	5% of GH₵792	$\frac{5}{100} \times 792 = 39.60$
$816 - 792 = 24$	24	10% of GH₵24	$\frac{10}{100} \times 24 = 2.40$
			Total = GH₵ 42.00

∴ Ali's income tax is GH₵ 42.00

iii) Annual Income tax for Lillian;

Remaining income GH₵	Amount to be taxed GH₵	Rate of tax	Tax paid (GH₵)
3600	1584	free	0
3600 - 1584 = 2016	792	5% of GH₵792	$\frac{5}{100} \times 792 = 39.60$
2016 – 792 = 1224	1104	10% of GH₵1104	$\frac{10}{100} \times 1104 = 110.40$
1224 – 1104 = 120	120	17.5% of GH₵120	$\frac{17.5}{100} \times 120 = 21.00$
			Total= GH₵171.00

∴ Lillian's annual income tax is GH₵ 171.00

iv) Annual Income tax for Mr. Nyame;

Remaining income (GH₵)	Amount to be taxed (GH₵)	Rate of tax (%)	Tax paid (GH₵)
29400	1584	free	0
29400 - 1584 = 27816	792	5% of GH₵792	$\frac{5}{100} \times 792 = 39.60$
27816 – 792 = 27024	1104	10% of GH₵1104	$\frac{10}{100} \times 1104 = 110.40$
27024 – 1104 = 25920	25920	17.5% of GH₵25920	$\frac{17.5}{100} \times 25920 = 4{,}536$
			Total = GH₵4,686.00

∴ Mr. Nyame's annual income tax is GH₵4,686.00

v) Annual Income tax for Mr. Ankrah;

Remaining income (GH₵)	Amount to be taxed (GH₵)	Rate of tax (%)	Tax paid (GH₵)
48000	1584	free	0
48000 - 1584 = 46416	792	5% of GH₵ 792	$\frac{5}{100} \times 792 = 39.60$
46416 – 792 = 45624	1104	10% of GH₵ 1104	$\frac{10}{100} \times 1104 = 110.40$
45624 – 1104 = 44520	28200	17.5% of GH₵ 28,200	$\frac{17.5}{100} \times 28200 = 4{,}935$
44520 – 28200 = 16320	16320	25% of GH₵ 16320	$\frac{25}{100} \times 16320 = 4{,}080$
			Total = GH₵ 9165.00

∴ Mr. Ankrah's annual income tax is GH₵ 9165.00

ACTIVITY 6.10

i) GH₵4,416.00
ii) GH₵8,856.00
iii) GH₵16,656.00
iv) GH₵12,416.00
v) GH₵6,656.00

ACTIVITY 6.11

i) GH₵43.20
ii) GH₵403.20

ACTIVITY 6.12

i) GH₵805.00
ii) GH₵632.00
iii) GH₵12,075.00

ACTIVITY 6.13

a) GH₵12.77
b) 13%
c) GH₵708.00

ACTIVITY 6.14

1) GH₵112.50
2) i) GH₵100,000.00
ii) GH₵15,000.00
iii) GH₵2,500.00

ACTIVITY 6.15

a) GH₵100.00
b) GH₵200.00
c) GH₵4000.00

UNIT 7

ALGEBRAIC EXPRESSIONS

ACTIVITY 7.1

i) $t = \frac{v-u}{a}$

ii) $b = \frac{a}{1-ac}$

iii) $x = \frac{t^2 g}{4x^2}$

iv) $h = \frac{3v}{\pi r^2}$

v) $x = \frac{7+3t}{5t-3}$

ACTIVITY 7.2

a) V = 37

b) E = 99

c) i) $\binom{14}{7}$

ii) $\binom{-10}{-8}$

d) $R = \frac{4}{5}$

e) i) $\binom{12}{-1}$

ii) $\binom{-20}{11}$

ACTIVITY 7.3

a) $ac + ad + bc + bd$

b) $t^2 - 5t - 6b$

c) $x^2 - 5x + 6$

d) $2y^2 + y - 3$

e) $x^2 + x - y^2 - y$

ACTIVITY 7.4

i) $4x^2 - 12xy + 9y^2$

ii) $90t^2 - 60t - 30$

iii) $2x^2 + 9x - 18$

iv) $a^4 + 20a^3 + 124a^2 + 192a + 864$

v) $2y^2 + 4y - 10$

ACTIVITY 7.5

a) i) $m^2 + 2mp + p^2$

ii) $m^2 - 2mp + p^2$

b) i) $4 - x^2$

ii) $9a^2 - y^2$

iii) $49a^2 - 25b^4$

ACTIVITY 7.6

a) i) $(a + d)(b + c)$

ii) $(x + 2)(3 - y)$

iii) $(3a + 1)(2 + b)$

b) i) $(y - 4)(2x + 3)$

ii) 39

ACTIVITY 7.7

a) $12x + 12$

b) $(x - 1) - (3x - 1)$

c) $(y - 4)(4x + 10)$ OR $(2x + 5)(2y - 8)$

d) $(x - y)(2x - z)$

e) $(x - y)(x + y + 1)$

UNIT 8

PROPERTIES OF POLYGONS

ACTIVITY 8.1

1) Right angled triangle
- Has one right angle (an angle of 90°)
- The square of the length of its longest side (hypotenuse) is equal to the sum of the square of the length of the other sides

2) Isosceles triangle
- Has two sides equal in length
- Has two angles equal in length
- Has one line of symmetry

3) Scalene triangle
- All three sides are not equal in length
- Al three angles are not equal in size
- Has no line of symmetry

4) Equilateral triangle
- Has three equal sides
- Has three equal angles
- Has three lines of symmetry

ACTIVITY 8.2

1) 120°
2) 1440°
3) 36°

ACTIVITY 8.3

1) 135°
2) 2340°
3) 6 sides

ACTIVITY 8.4

1) a) 72°
b) 40°
2) 6 sides

ACTIVITY 8.5

1) 5cm
2) 82cm

ACTIVITY 8.6

1) 18cm
2) a) 32cm
b) 36cm^2

ACTIVITY 8.7

a) 17km
b) 25cm

ACTIVITY 8.8

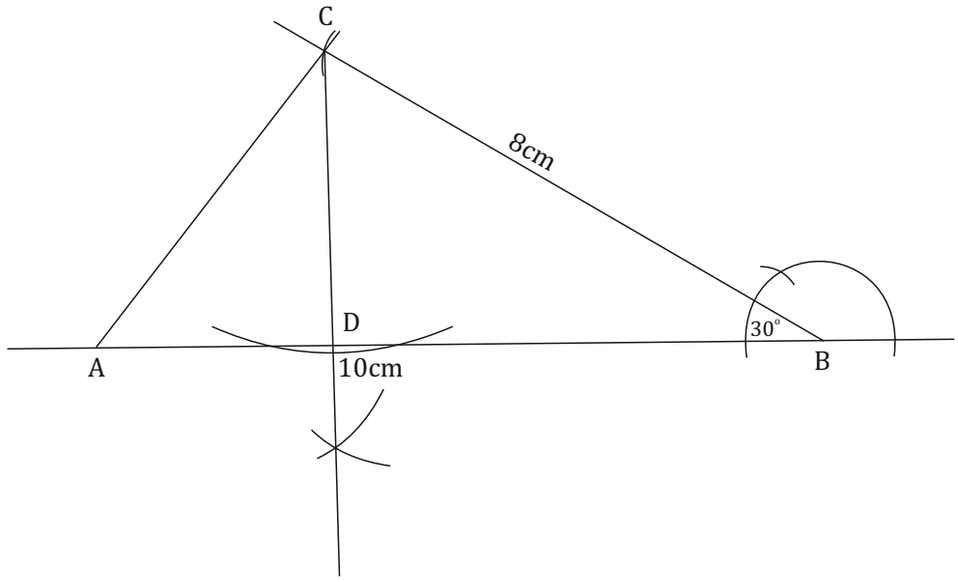
i) 10 units
ii) 10 units

ACTIVITY 8.9

i) 5 units
ii) 12km

GEOMETRIC CONSTRUCTION

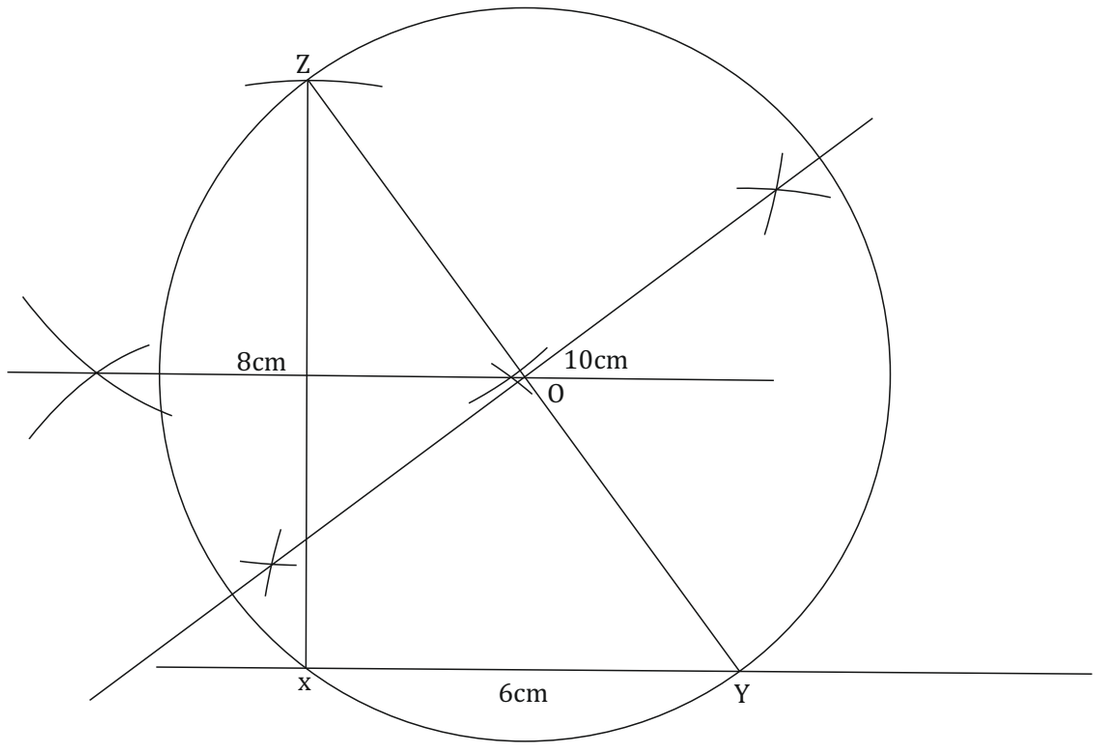
ACTIVITY 9.1



a) i) 97°
ii) 4cm

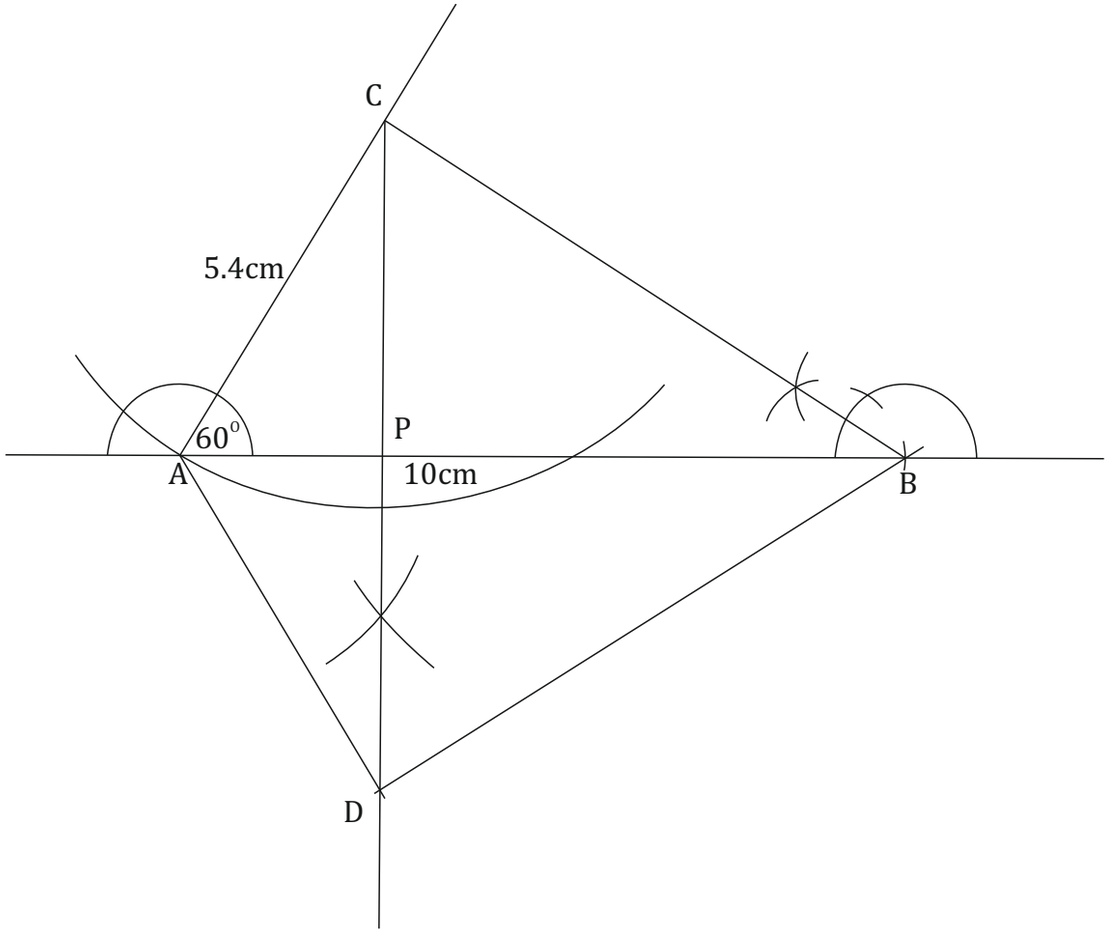
b) 20cm^2

ACTIVITY 9.2



c) Radius = 5cm
Circumference = 31.4cm

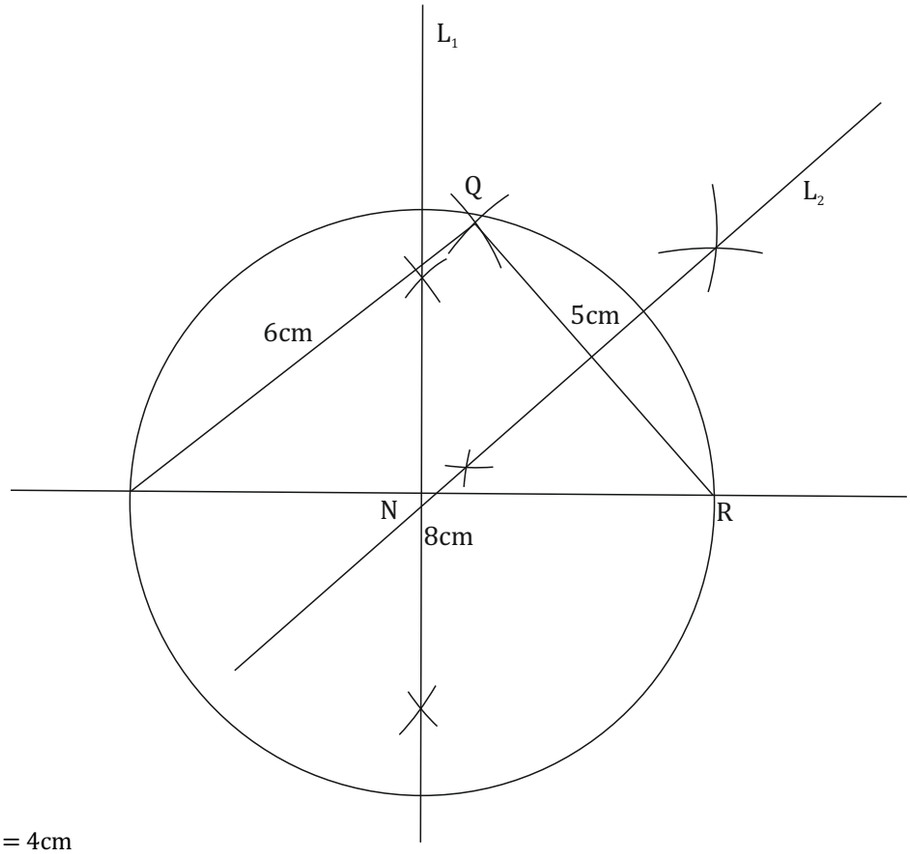
ACTIVITY 9.3



b) iii) |AC| = 5.4? ; |DC| = 5.4?

c) Kite

ACTIVITY 9.4



b) Radius = 4cm
Circumference = 25.1cm

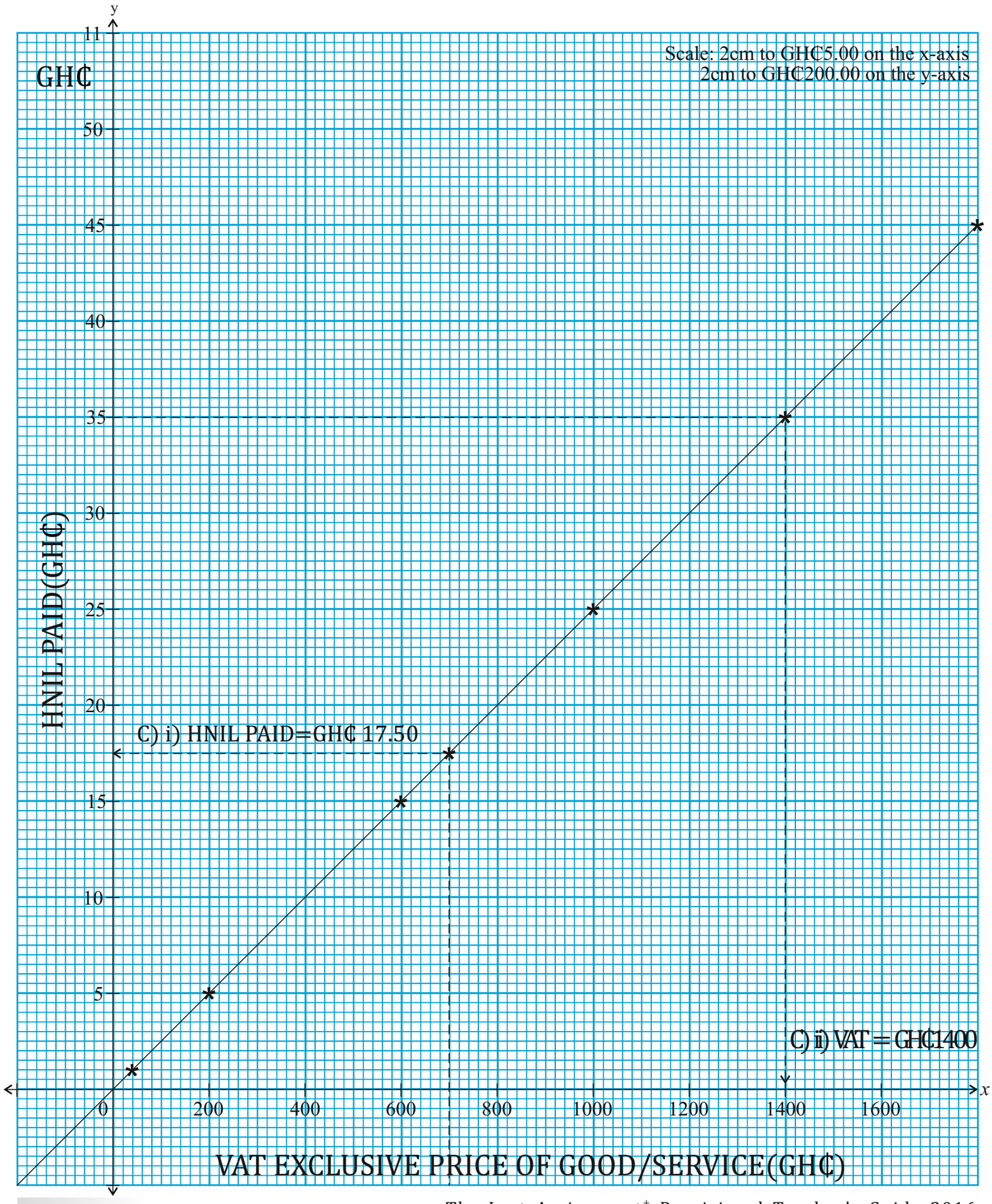
NUMBERE PLANE

ACTIVITY 10.1

c) i) GH₵17.50
ii) GH₵1400.00
iii) GH₵55.00

d) i) $\frac{1}{40}$
ii) 2.5%
iii) NHIL

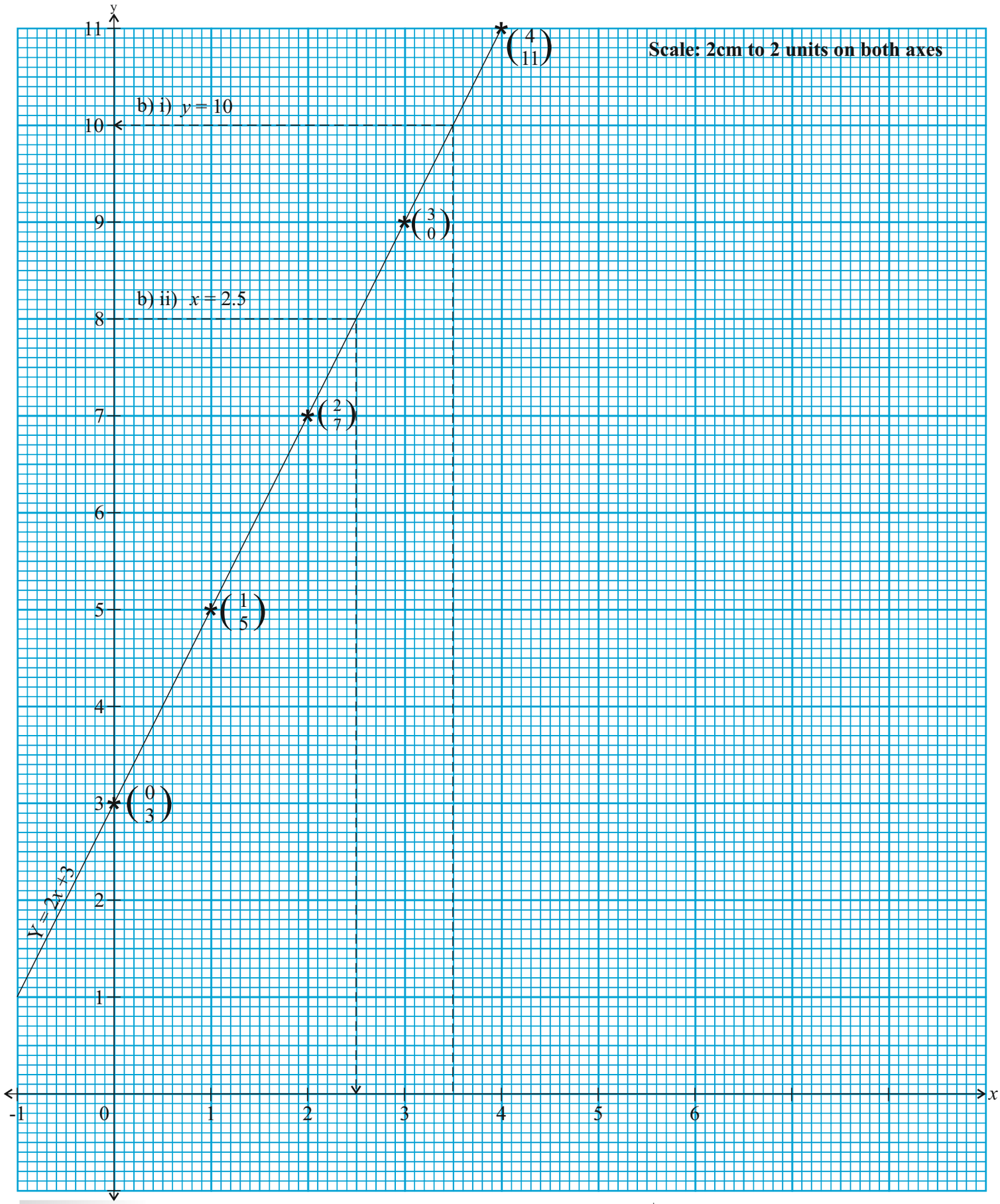
e) GH₵1,000.00


y
GH₵
Scale: 2cm to GH₵5.00 on the x-axis
2cm to GH₵200.00 on the y-axis
11
50
45
40
35
30
25
20
15
10
5
0
200
400
600
800
1000
1200
1400
1600
x
HNIL PAID(GH₵)
C) i) HNIL PAID=GH₵ 17.50
C) ii) VAT = GH₵1400
VAT EXCLUSIVE PRICE OF GOOD/SERVICE(GH₵)

ACTIVITY 10.2

b) i) $y = 10$
ii) $x = 2.5$
iii) 2

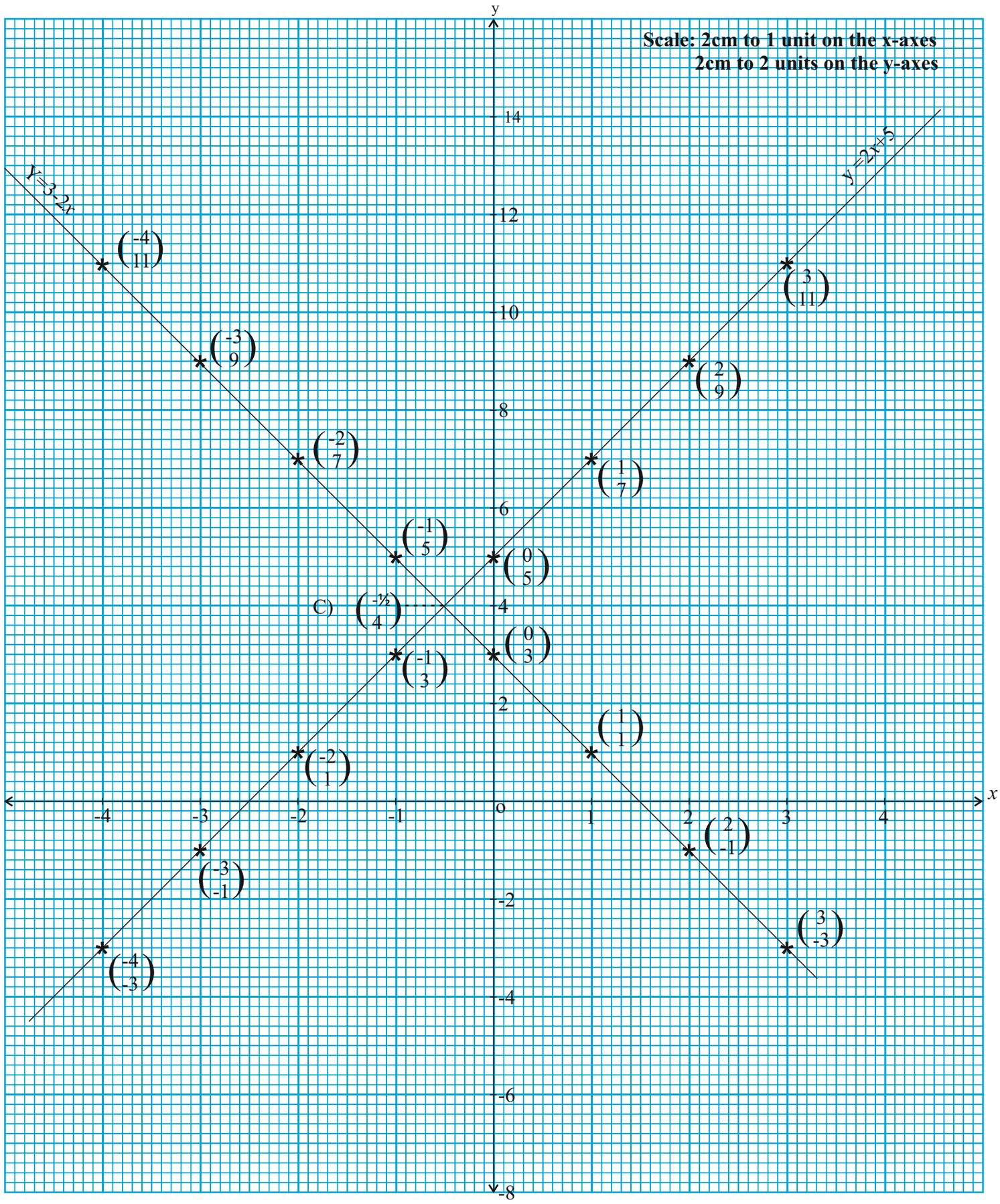
NOTES


Scale: 2cm to 2 units on both axes
b) i) $y = 10$
b) ii) $x = 2.5$
$y = 2x + 3$
$\begin{pmatrix} 4 \\ 11 \end{pmatrix}$
$\begin{pmatrix} 3 \\ 0 \end{pmatrix}$
$\begin{pmatrix} 2 \\ 7 \end{pmatrix}$
$\begin{pmatrix} 1 \\ 5 \end{pmatrix}$
$\begin{pmatrix} 0 \\ 3 \end{pmatrix}$
y
x
-1
0
1
2
3
4
5
6
1
2
3
4
5
6
7
8
9
10
11

ACTIVITY 10.3

c) (–0.5, 4)

NOTES


Scale: 2cm to 1 unit on the x-axes
2cm to 2 units on the y-axes
y
x
O
y=3-2x
y=2x+5
(-4, 11)
(-3, 9)
(-2, 7)
(-1, 5)
(-½, 4)
(0, 5)
(1, 7)
(2, 9)
(3, 11)
(-4, -3)
(-3, -1)
(-2, 1)
(-1, 3)
(0, 3)
(1, 1)
(2, -1)
(3, -3)
14
12
10
8
6
4
2
-2
-4
-6
-8
-4
-3
-2
-1
1
2
3
4

UNIT 11

STATISTICS

ACTIVITY 11.1

a) Nigeria
b) Togo
c) 25%
d) 216,000
e) Sales of magazines in Nigeria are equal to sales of magazines in Benin, Ghana and Togo.

ACTIVITY 11.2

i) 7000 books
ii) 6000 books
iii) 3 schools

ACTIVITY 11.3

a) i) 2
ii) 6
iii) 8
iv) 325

b) $\frac{4}{27}$

ACTIVITY 11.4

b) 3

ACTIVITY 11.5

i)

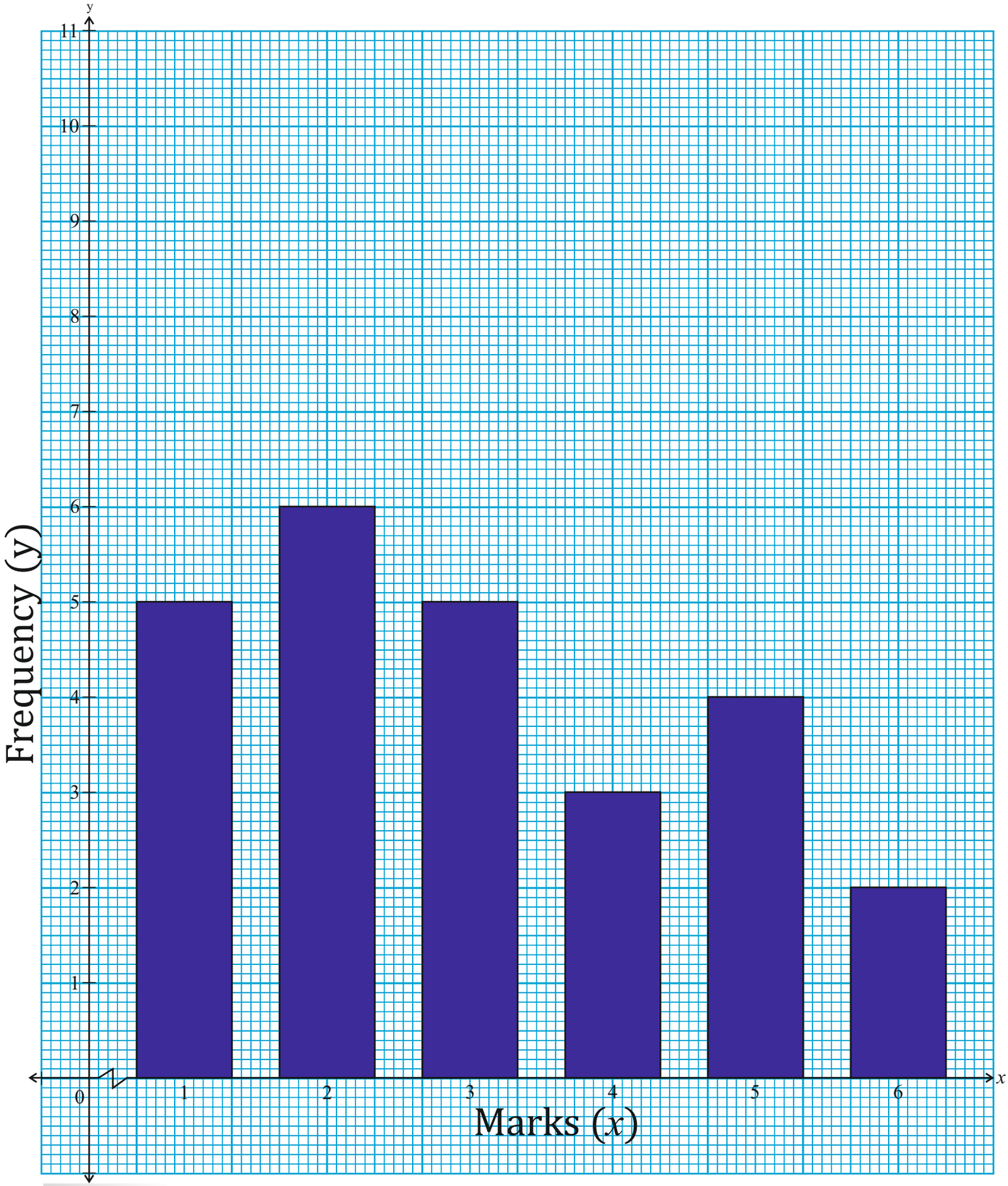
Stem	Leaf
0	6, 8
1	0, 2, 8
2	2, 6, 7
3	1, 6, 7, 9
4	2, 3, 4, 7, 8
5	3, 5, 9

Key: 0|6 means 6 marks

ii) $\frac{1}{4}$
iii) 12 students

ACTIVITY 11.6

a) 9 marks
b) 98 marks
c) 79 marks
d) 89 marks
e) 40 students
f) 24 students
g) 65%
h) $\frac{3}{5}$


y
11
10
9
8
7
6
5
4
3
2
1
0
Frequency (y)
1
2
3
4
5
6
x
Marks (x)