

**Paper Reference 9FM0/3D**  
**Pearson Edexcel Level 3 GCE**  
**Further Mathematics**  
**Advanced**  
**Paper 3D: Decision Mathematics 1**

**Monday 24 June 2019 – Morning**

**Diagram Book**

**In the boxes below, write your name,  
centre number and candidate number.**

<b>Surname</b>										
<b>Other names</b>										
<b>Centre Number</b>										
<b>Candidate Number</b>										

# INSTRUCTIONS

**There are two copies of all diagrams in case you need them.**

**THIS DIAGRAM BOOK MUST BE  
RETURNED WITH THE ANSWER  
BOOK AT THE END OF THE  
EXAMINATION.**

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Diagram 1

[The total weight of the network is 370]

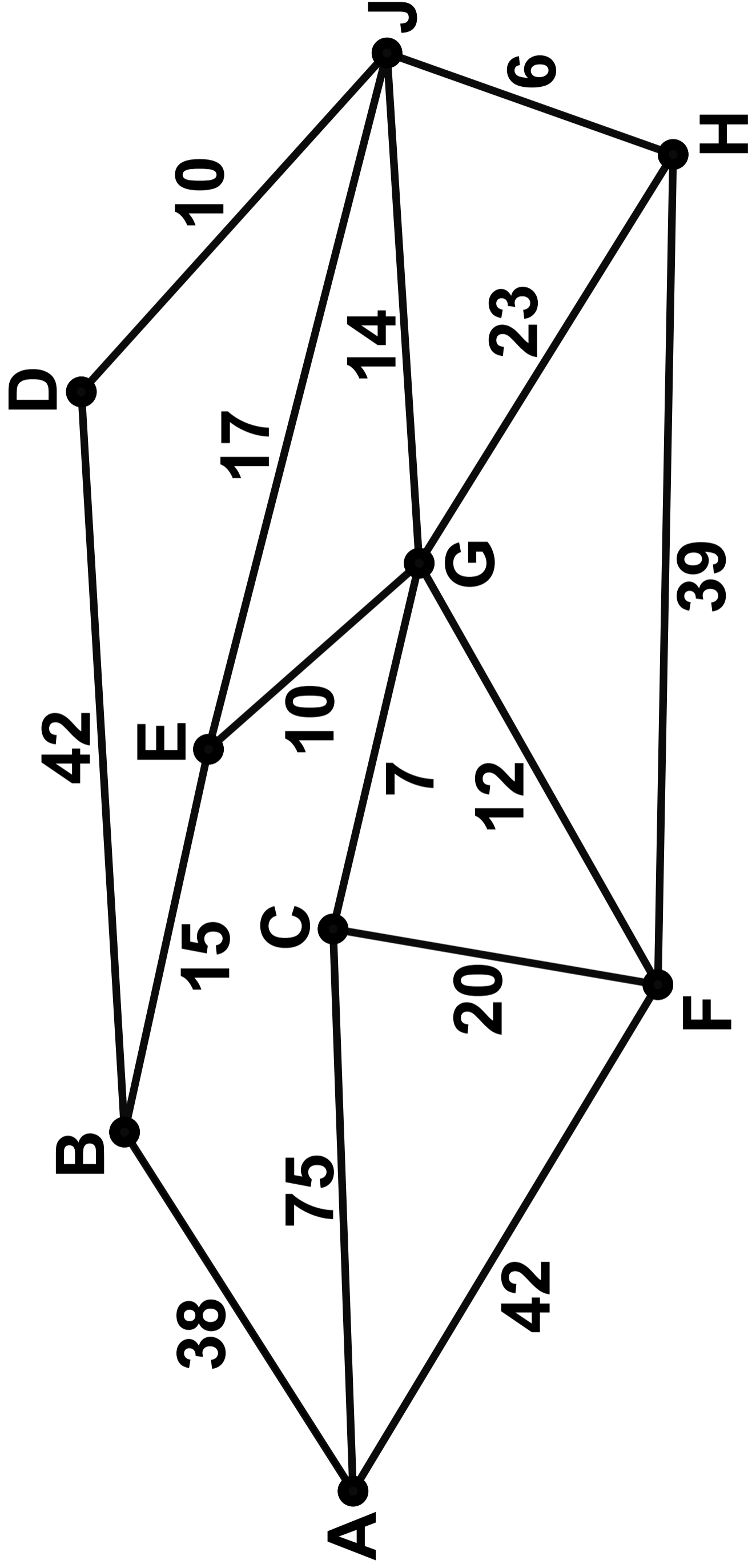


Diagram 1

[The total weight of the network is 370]

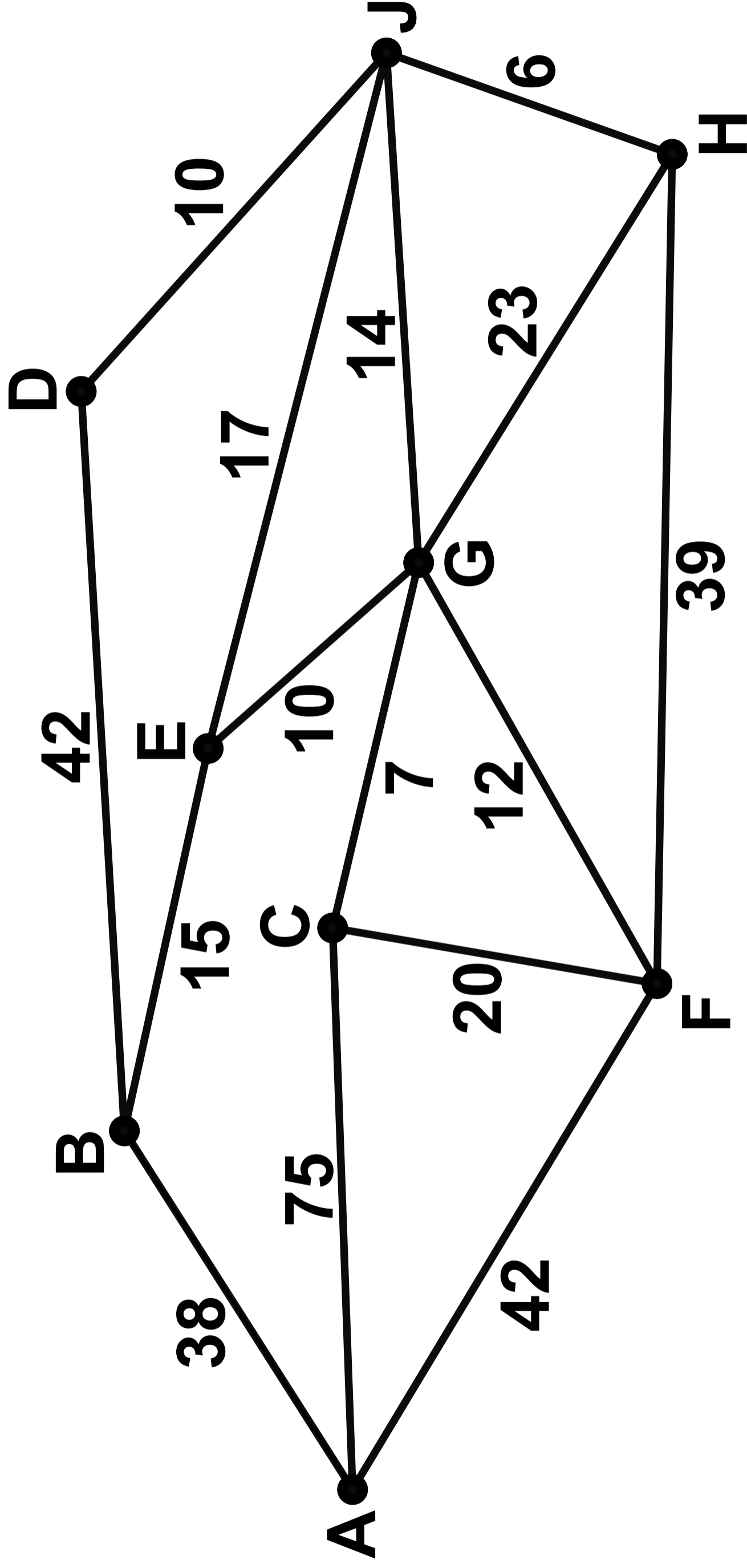
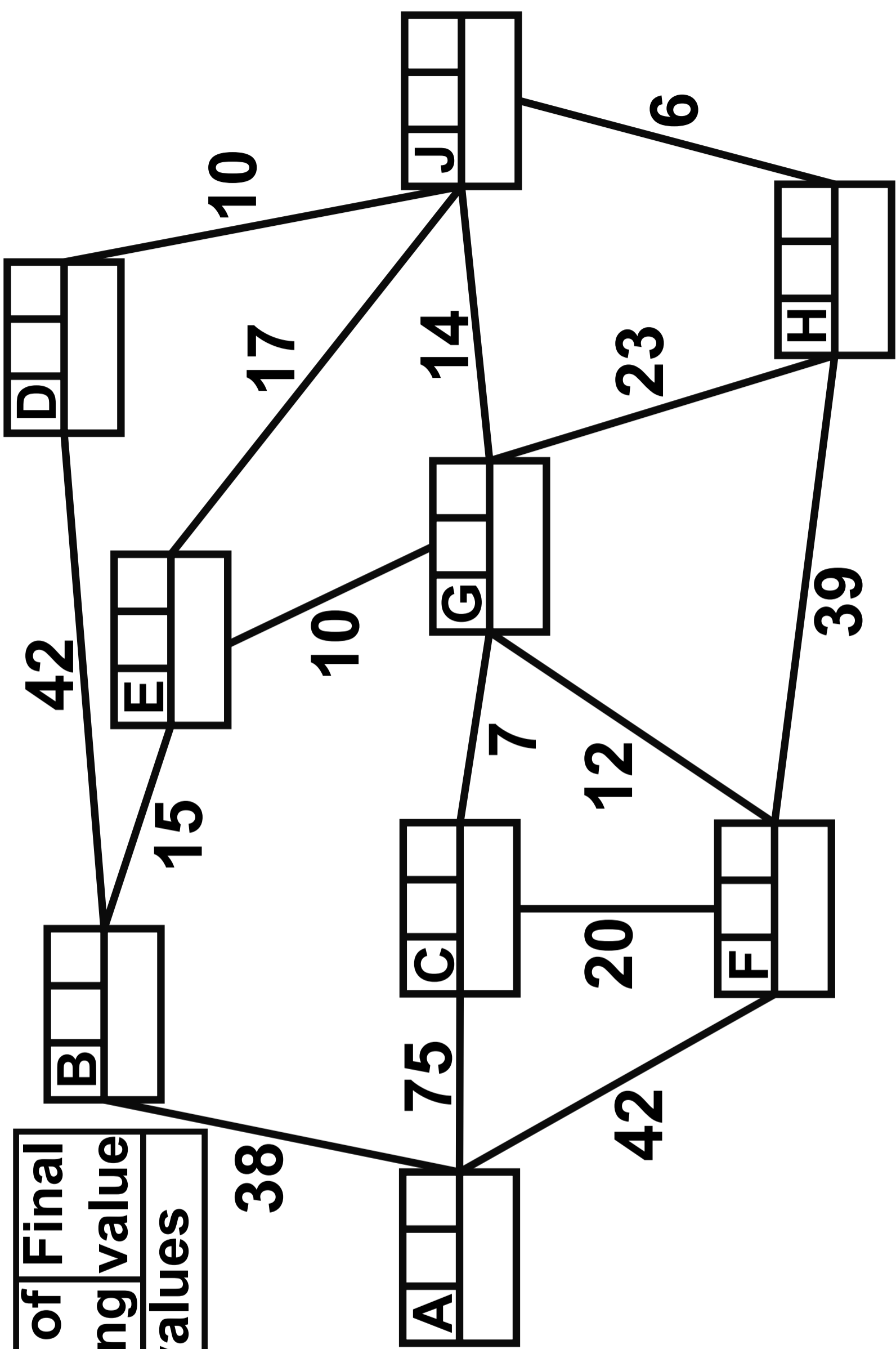


Diagram 2

Key:

Vertex	Order of labelling	Final value
Working values		

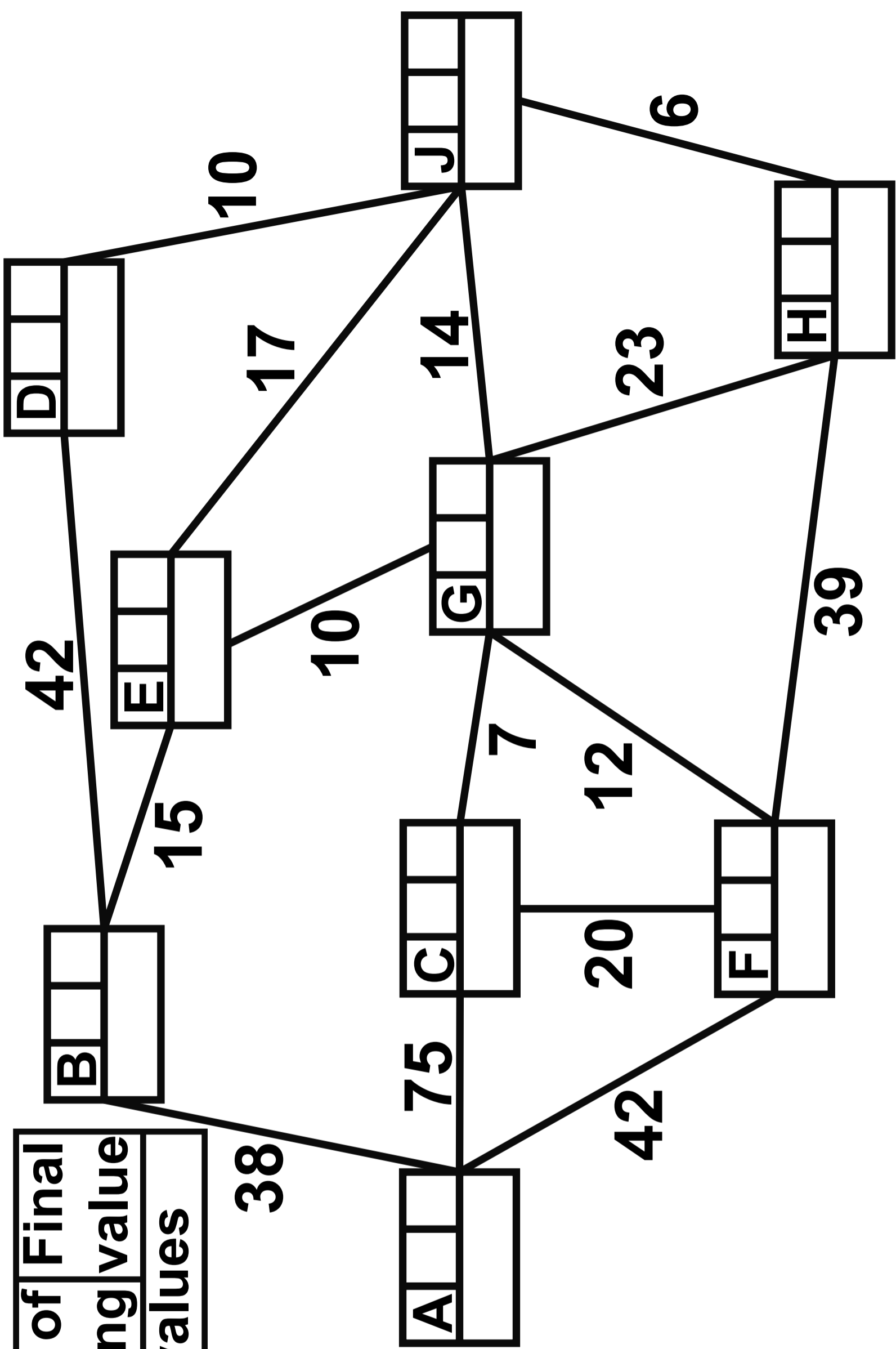


Shortest path from A to D: \_\_\_\_\_  
Length of shortest path from A to D: \_\_\_\_\_

Diagram 2

Key:

Vertex	Order of labelling	Final value
Working values		



Shortest path from A to D: \_\_\_\_\_  
Length of shortest path from A to D: \_\_\_\_\_

Diagram 3

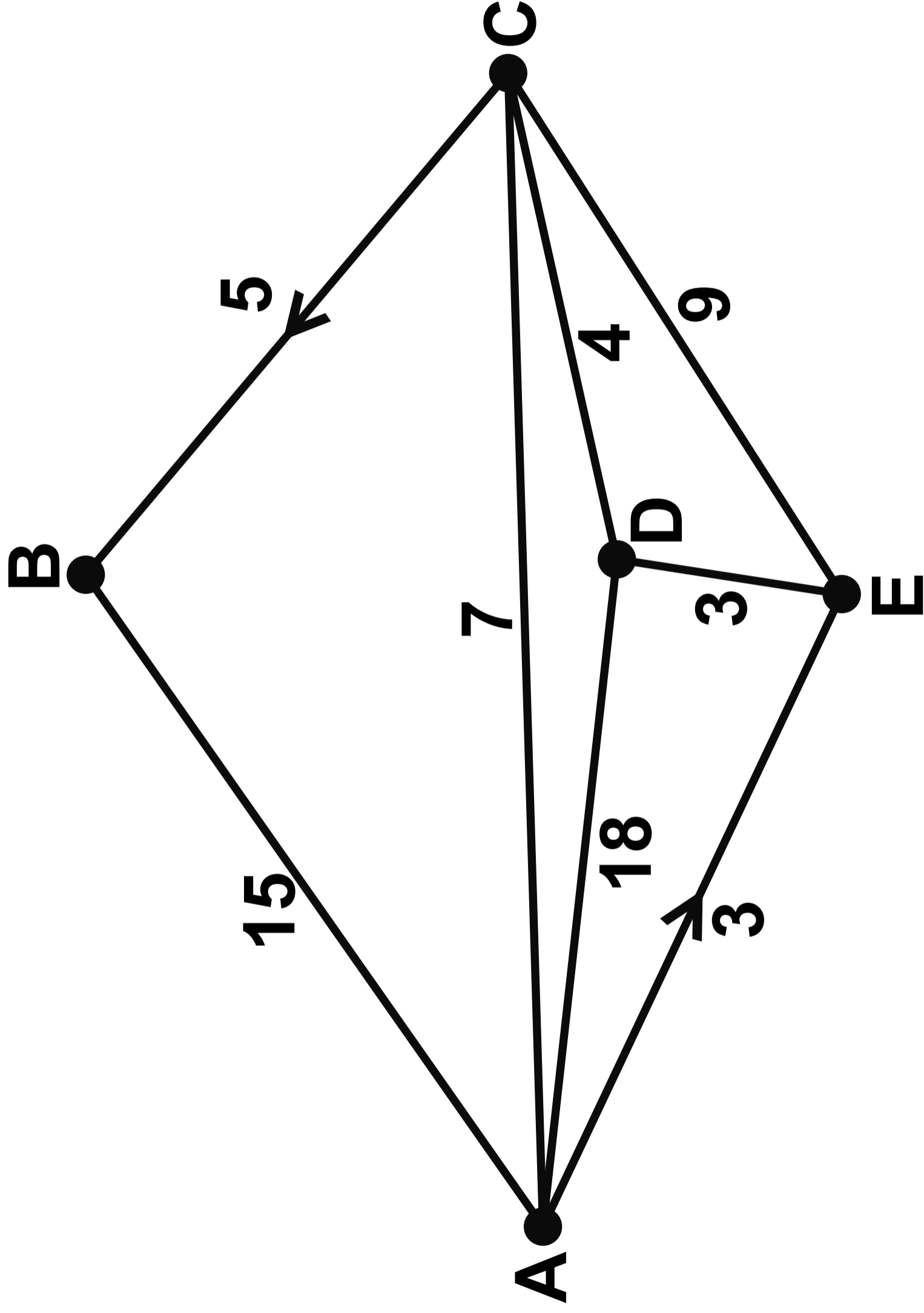
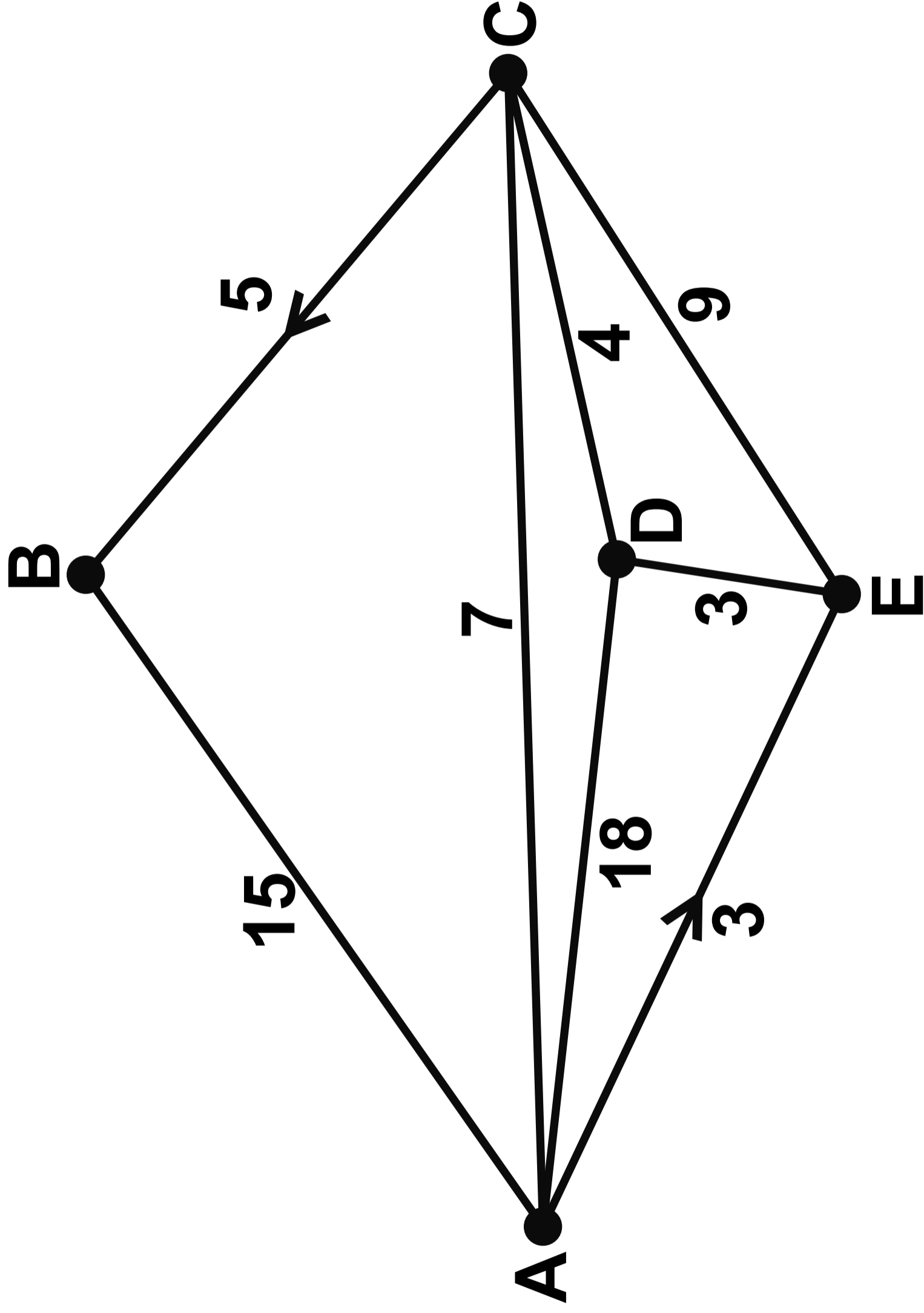


Diagram 3



Initial distance table

	A	B	C	D	E
A					
B					
C					
D					
E					

Initial route table

	A	B	C	D	E
A					
B					
C					
D					
E					

Initial distance table

	A	B	C	D	E
A					
B					
C					
D					
E					

Initial route table

	A	B	C	D	E
A					
B					
C					
D					
E					

1st iteration

Distance table

	A	B	C	D	E
A					
B					
C					
D					
E					

Route table

	A	B	C	D	E
A					
B					
C					
D					
E					

2nd iteration

Distance table

	A	B	C	D	E
A					
B					
C					
D					
E					

Route table

	A	B	C	D	E
A					
B					
C					
D					
E					

3rd iteration  
Distance table

	A	B	C	D	E
A					
B					
C					
D					
E					

Route table

	A	B	C	D	E
A					
B					
C					
D					
E					

1st iteration

Distance table

	A	B	C	D	E
A					
B					
C					
D					
E					

Route table

	A	B	C	D	E
A					
B					
C					
D					
E					

2nd iteration

Distance table

	A	B	C	D	E
A					
B					
C					
D					
E					

Route table

	A	B	C	D	E
A					
B					
C					
D					
E					

3rd iteration  
Distance table

	A	B	C	D	E
A					
B					
C					
D					
E					

Route table

	A	B	C	D	E
A					
B					
C					
D					
E					

Distance table

	A	B	C	D	E
A	—	12	7	6	3
B	15	—	22	21	18
C	7	5	—	4	7
D	11	9	4	—	3
E	14	12	7	3	—

Route table

	A	B	C	D	E
A	A	—	—	—	—
B	A	B	—	—	—
C	A	B	C	—	—
D	C	C	C	D	—
E	D	D	D	D	E

Distance table

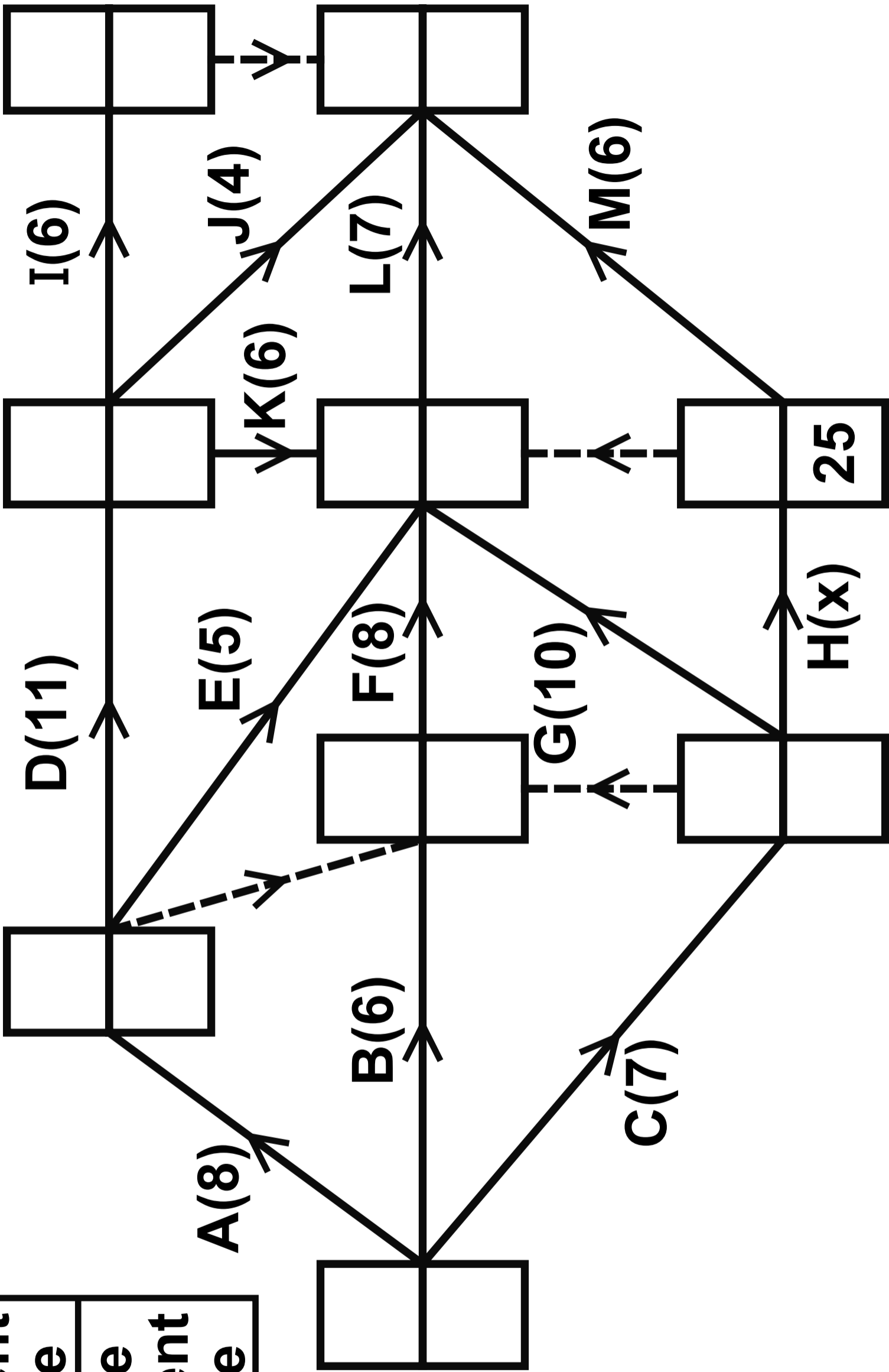
	A	B	C	D	E
A	—	12	7	6	3
B	15	—	22	21	18
C	7	5	—	4	7
D	11	9	4	—	3
E	14	12	7	3	—

Route table

	A	B	C	D	E
A	A	—	—	—	—
B	A	B	—	—	—
C	A	B	C	—	—
D	C	C	C	D	—
E	D	D	D	D	E

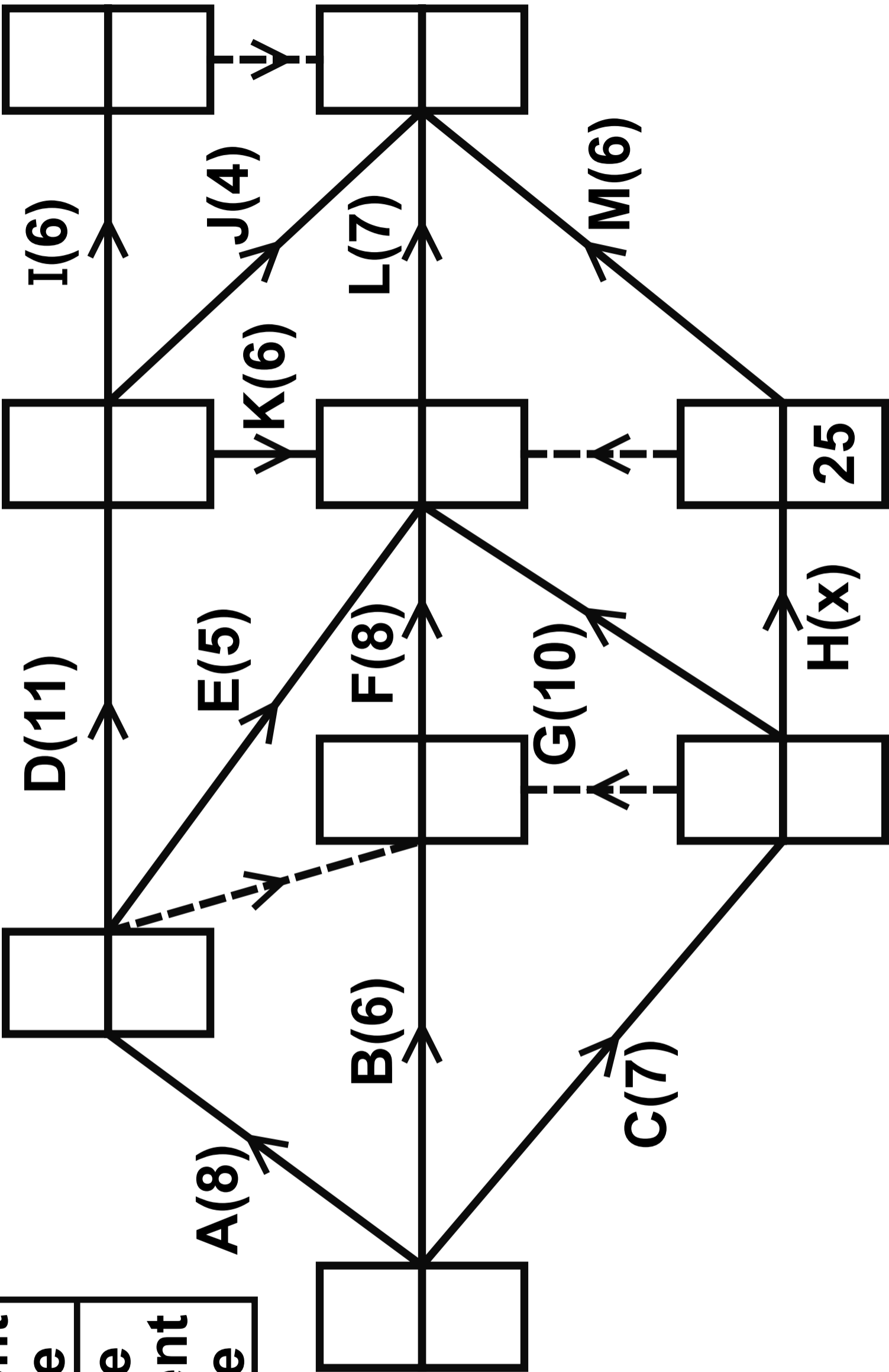
Key:

Early event time	Late event time
------------------------	-----------------------



Key:

Early event time	Late event time
------------------------	-----------------------



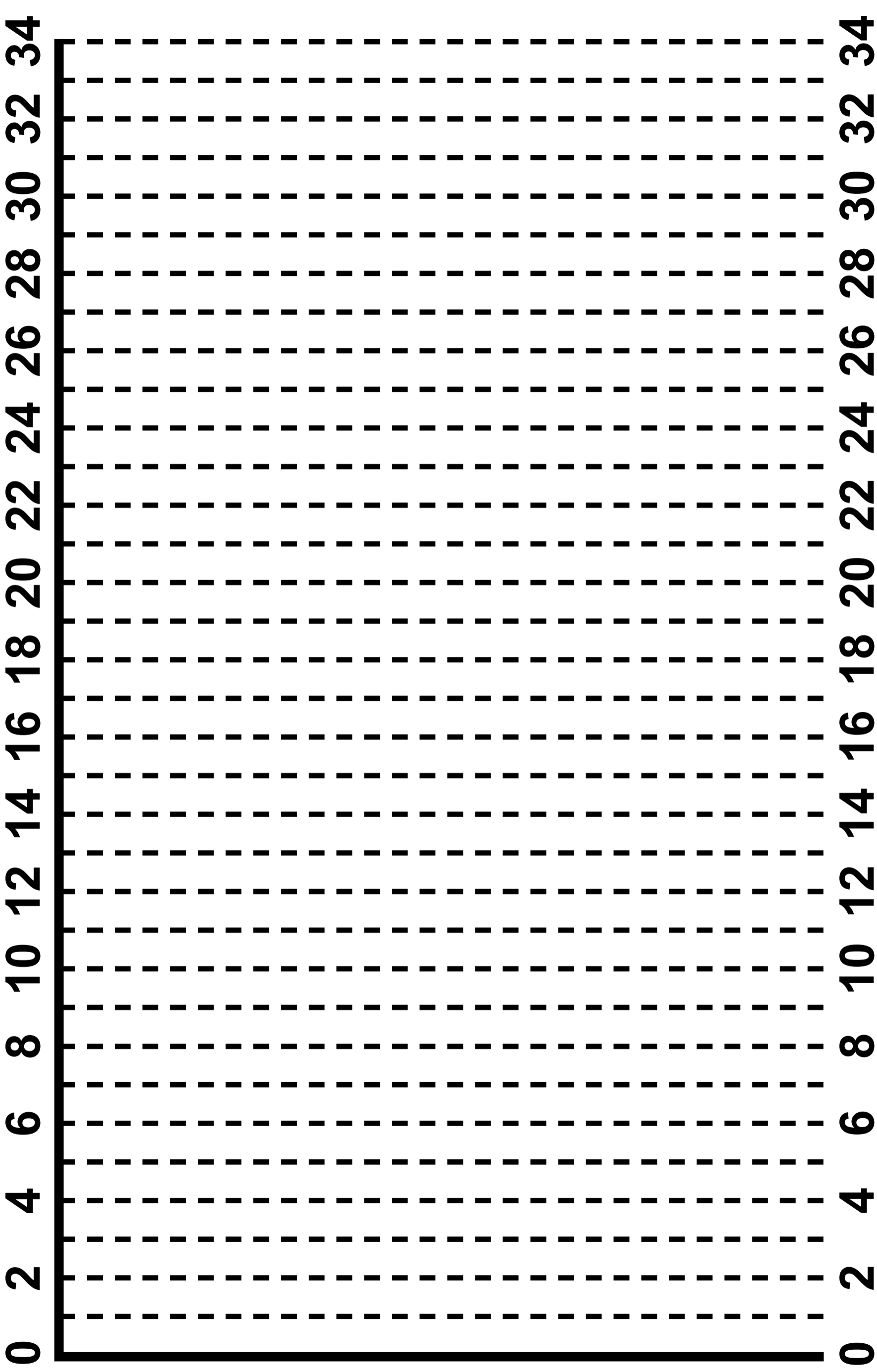
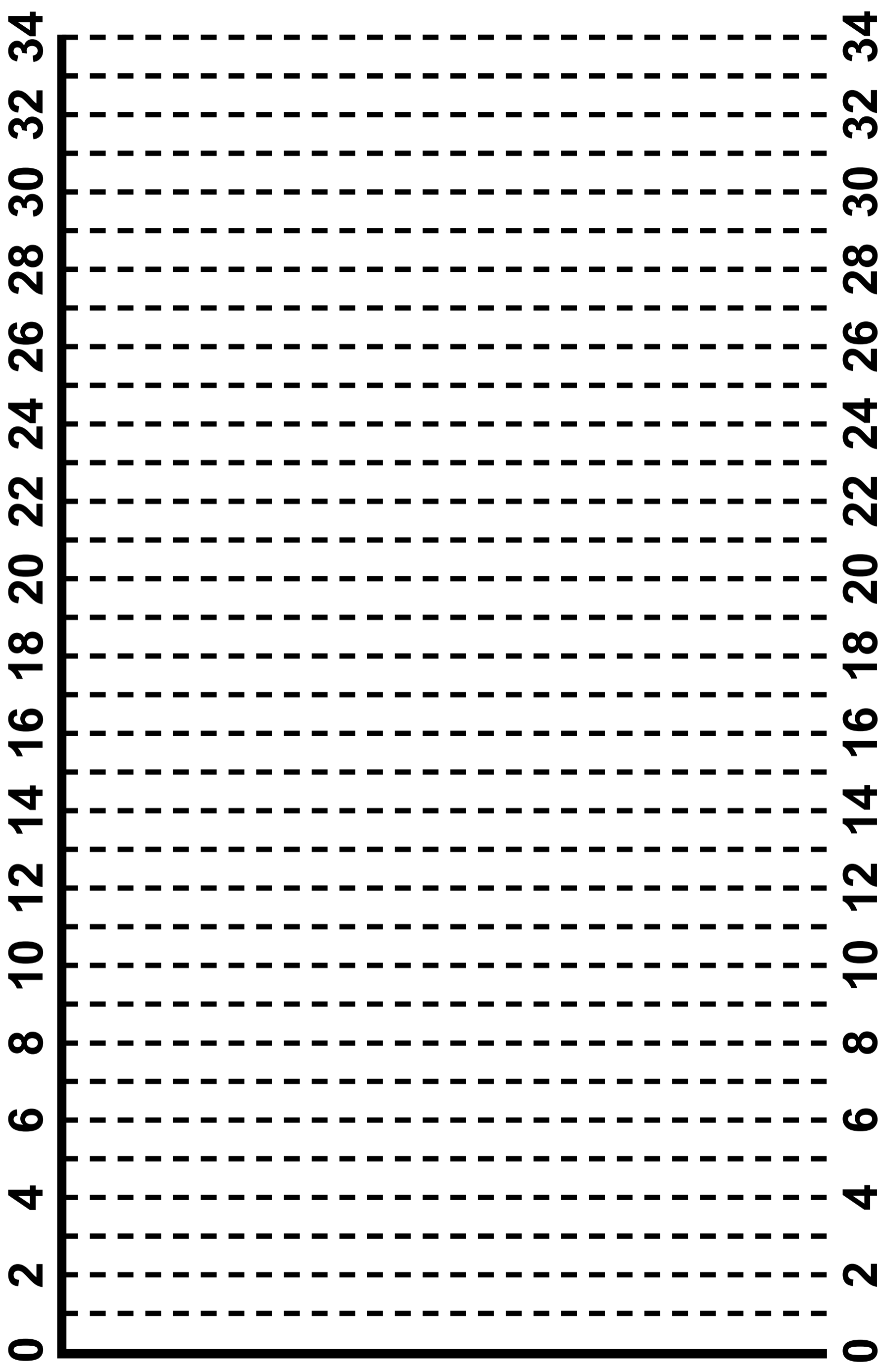


Diagram 8



Activity	Immediately preceding activities
A	—
B	—
C	—
D	A
E	C
F	B, C, D
G	A
H	B, C, D
I	B, C, D, G
J	B, C, D, G
K	E, H

Activity	Immediately preceding activities
A	—
B	—
C	—
D	A
E	C
F	B, C, D
G	A
H	B, C, D
I	B, C, D, G
J	B, C, D, G
K	E, H





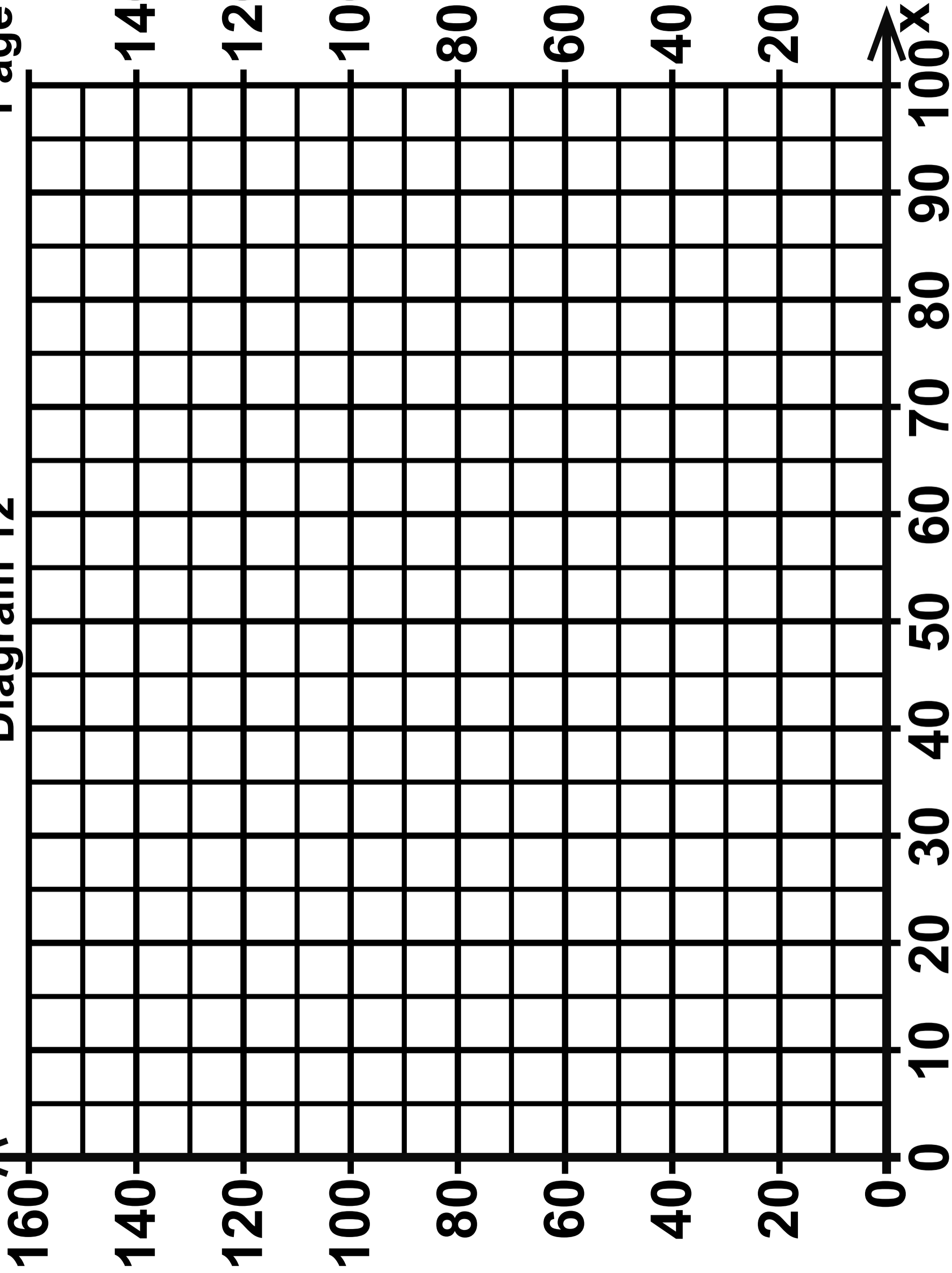
b.v.	x	y	z	s <sub>1</sub>	s <sub>2</sub>	s <sub>3</sub>	a <sub>1</sub>	a <sub>2</sub>	Value
s <sub>1</sub>	3	0	1.5	1	0	0.25	0	-0.25	26.25
a <sub>1</sub>	1	0	1.5	0	-1	-0.25	1	0.25	11.75
y	0	1	0.5	0	0	-0.25	0	0.25	3.75
P	-(2 + M)	0	2 - 1.5M	0	M	-0.5 + 0.25M	0	0.5 + 0.75M	7.5 - 11.75M

b.v.	x	y	z	s <sub>1</sub>	s <sub>2</sub>	s <sub>3</sub>	a <sub>1</sub>	a <sub>2</sub>	Value
s <sub>1</sub>	3	0	1.5	1	0	0.25	0	-0.25	26.25
a <sub>1</sub>	1	0	1.5	0	-1	-0.25	1	0.25	11.75
y	0	1	0.5	0	0	-0.25	0	0.25	3.75
P	-(2 + M)	0	2 - 1.5M	0	M	-0.5 + 0.25M	0	0.5 + 0.75M	7.5 - 11.75M

$y \wedge$

Diagram 12

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$y$

Diagram 12

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