

**Paper Reference 9FM0/3D**  
**Pearson Edexcel**  
**Level 3 GCE**

**Further Mathematics**  
**Advanced**  
**PAPER 3D: Decision**  
**Mathematics 1**

**Diagram Booklet**

**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 each diagram in case you need them.

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

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Diagram 1

[The total weight of the network is 299]

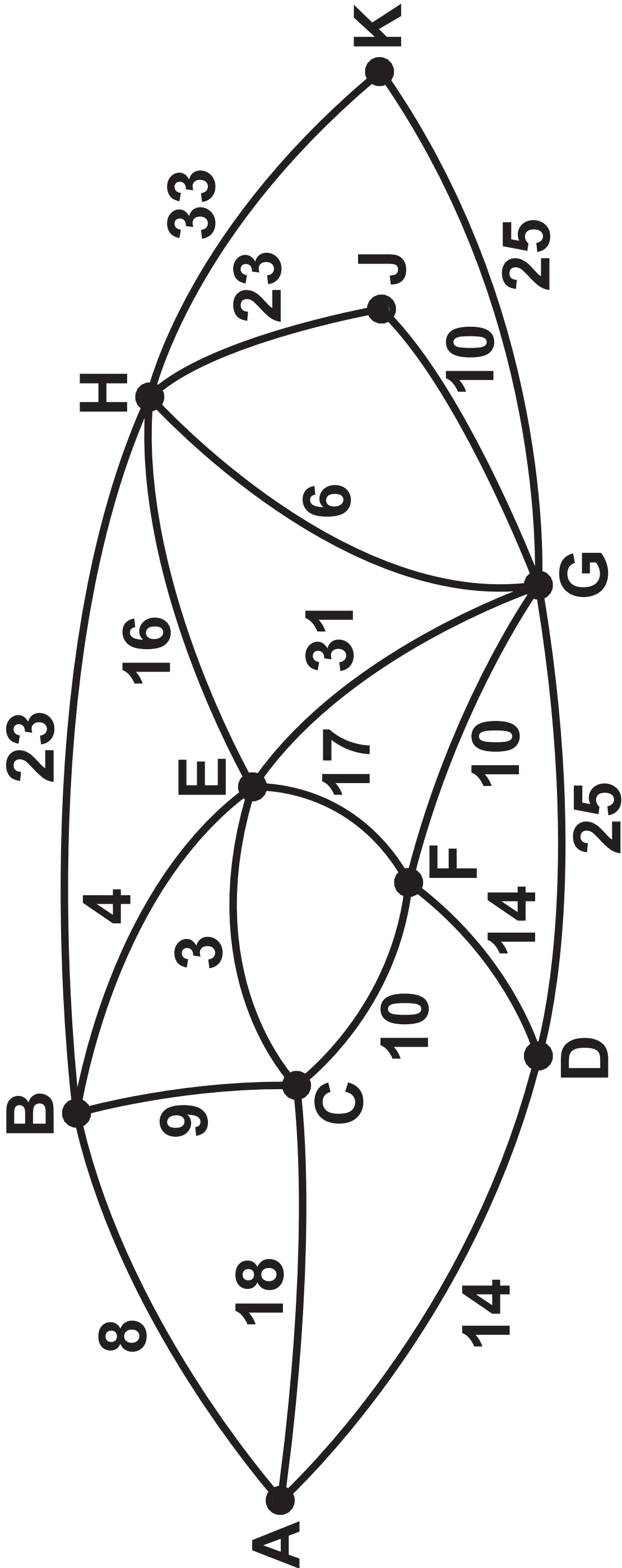
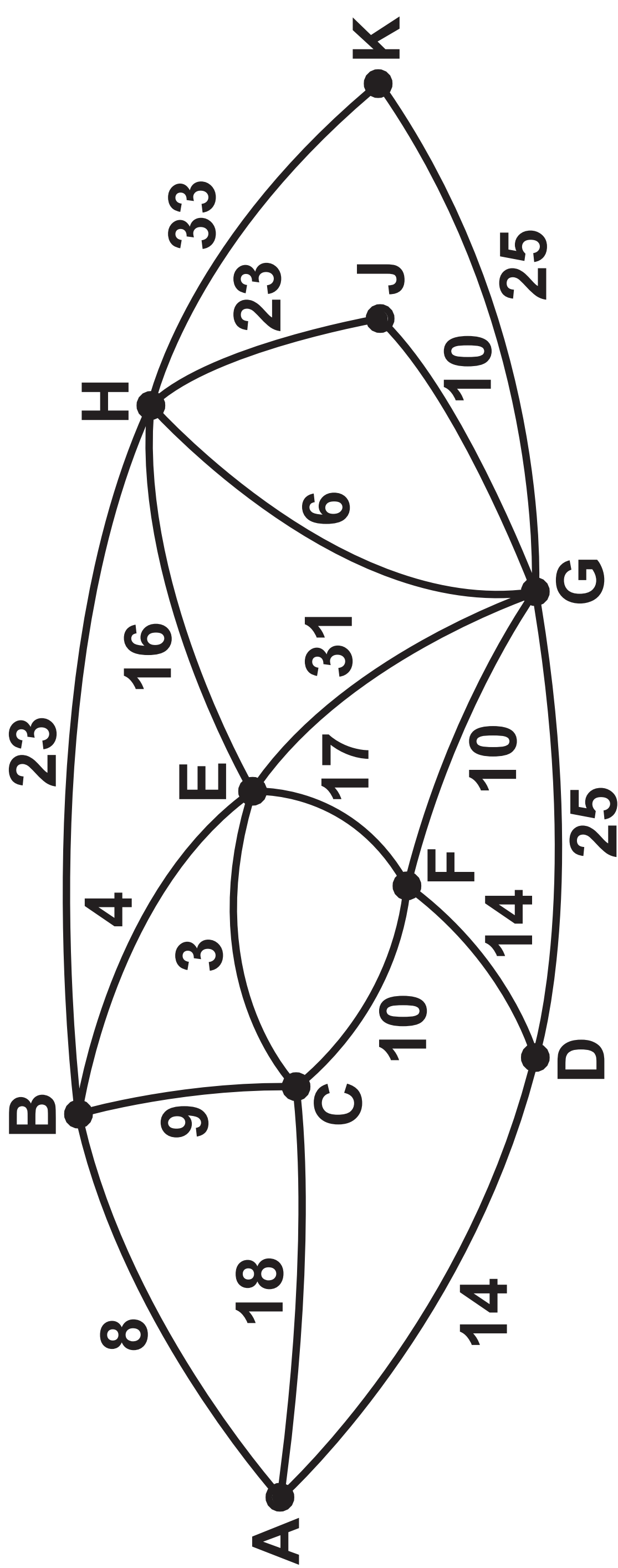


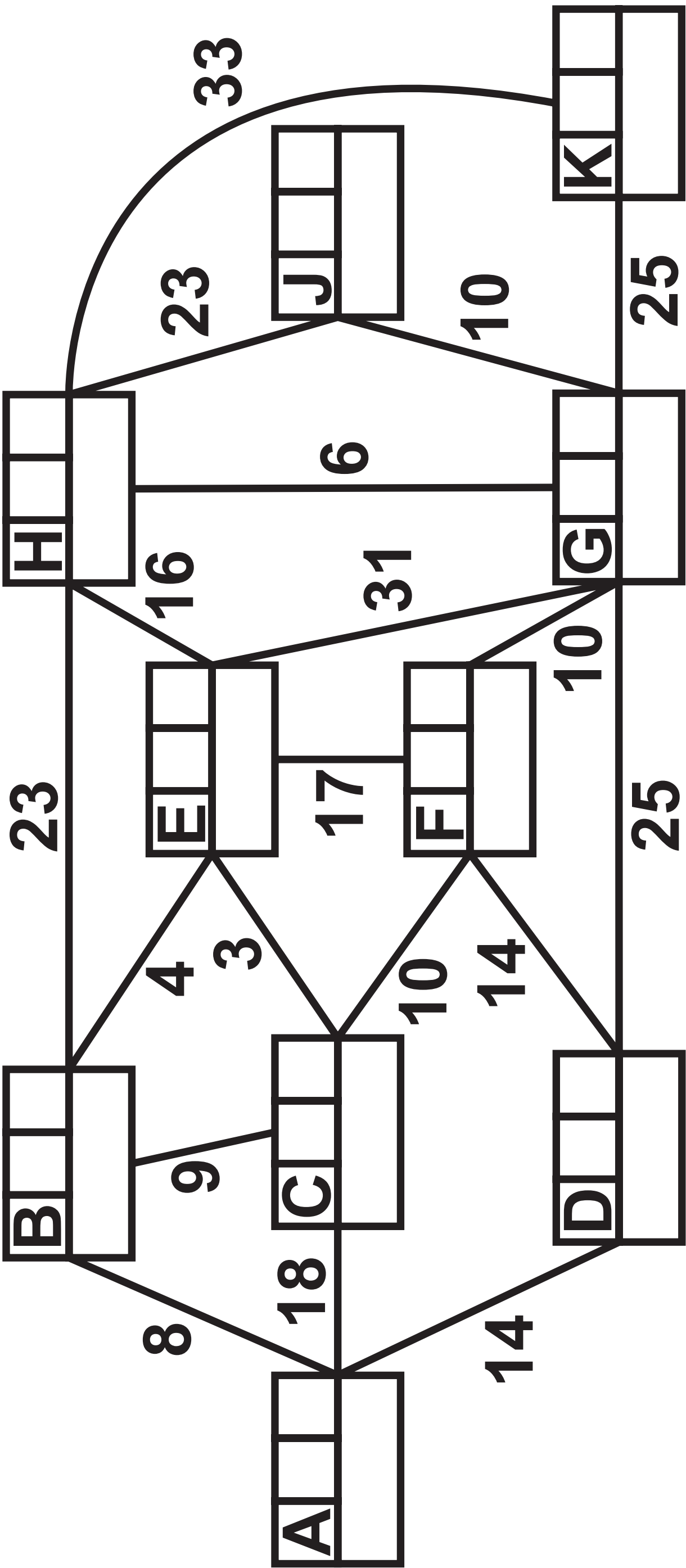
Diagram 1

[The total weight of the network is 299]



KEY:

Vertex	Order of labelling	Final value
Working value		



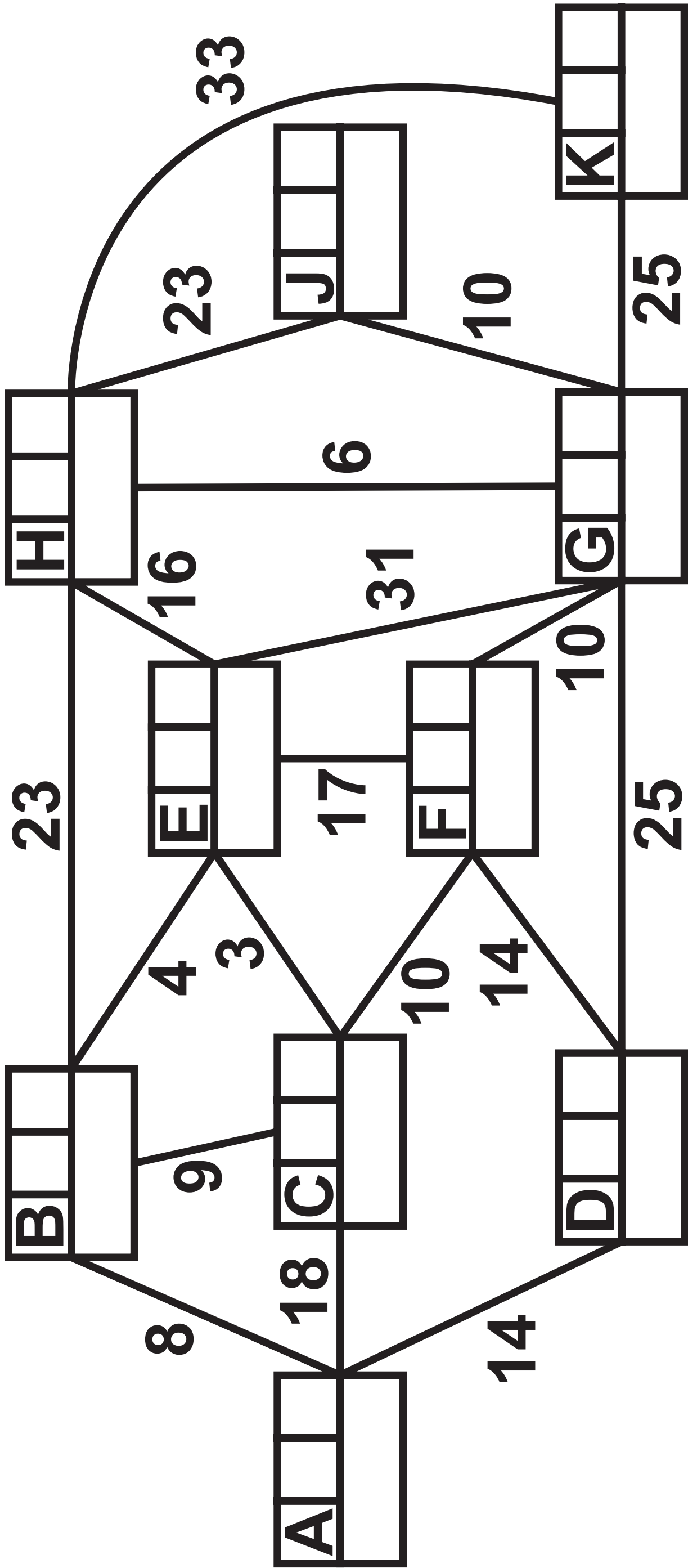
Shortest path from A to K: \_\_\_\_\_

Length of shortest path from A to K: \_\_\_\_\_



KEY:

Vertex	Order of labelling	Final value
Working value		



Shortest path from A to K: \_\_\_\_\_

Length of shortest path from A to K: \_\_\_\_\_

## Diagram 3

	A	B	C	D	E	F
A	–	12	32	24	29	11
B	12	–	17	8	$\infty$	$\infty$
C	32	17	–	4	12	$\infty$
D	24	$\infty$	4	–	$\infty$	13
E	$\infty$	$\infty$	12	18	–	12
F	11	$\infty$	$\infty$	13	12	–

Diagram 3

	A	B	C	D	E	F
A	–	12	32	24	29	11
B	12	–	17	8	∞	∞
C	32	17	–	4	12	∞
D	24	∞	4	–	∞	13
E	∞	∞	12	18	–	12
F	11	∞	∞	13	12	–

Diagram 4

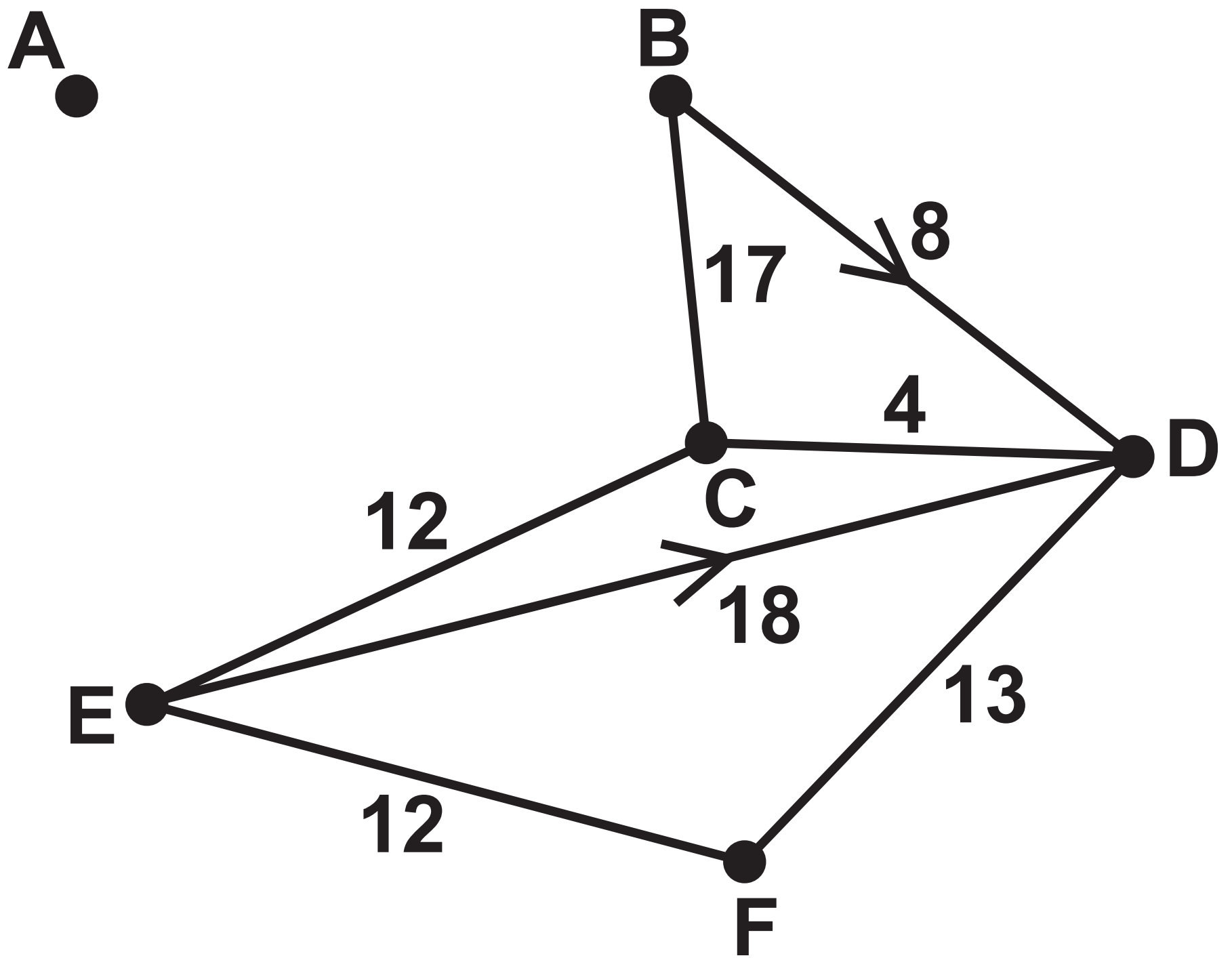


Diagram 4

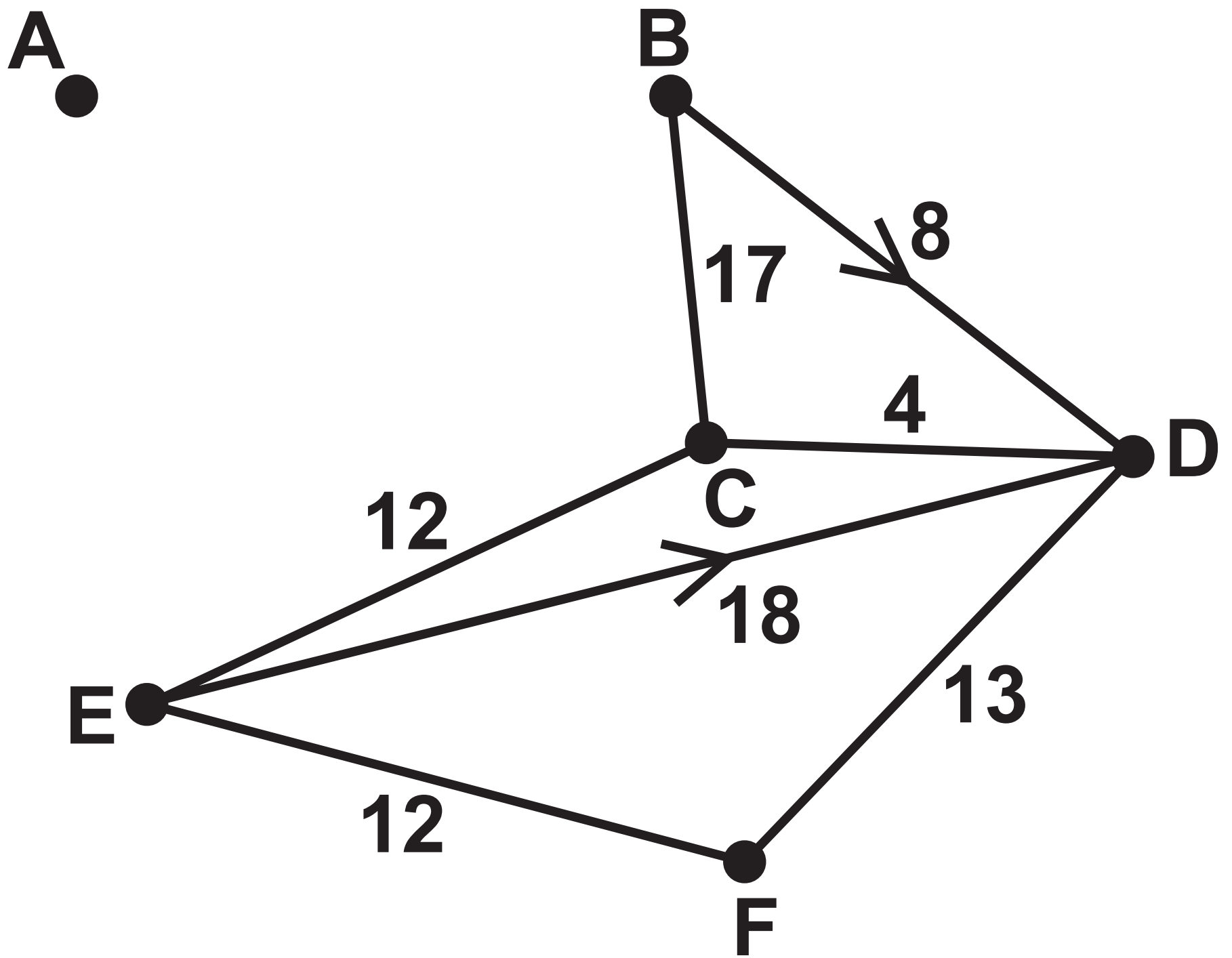


Diagram 5

	A	B	C	D	E	F
A	–	12	29	20	29	11
B	12	–	17	8	41	23
C	29	17	–	4	12	40
D	24	36	4	–	53	13
E	$\infty$	$\infty$	12	18	–	12
F	11	23	40	13	12	–

## Diagram 5

	A	B	C	D	E	F
A	–	12	29	20	29	11
B	12	–	17	8	41	23
C	29	17	–	4	12	40
D	24	36	4	–	53	13
E	$\infty$	$\infty$	12	18	–	12
F	11	23	40	13	12	–

## Diagram 6

	A	B	C	D	E	F
A	–	12	24	20	23	11
B	12	–	12	8	24	21
C	28	17	–	4	12	17
D	24	21	4	–	16	13
E	23	29	12	16	–	12
F	11	23	17	13	12	–



Diagram 6

	A	B	C	D	E	F
A	–	12	24	20	23	11
B	12	–	12	8	24	21
C	28	17	–	4	12	17
D	24	21	4	–	16	13
E	23	29	12	16	–	12
F	11	23	17	13	12	–

Diagram 7

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>	2	3	4	1	0	0	0	0	13
a <sub>1</sub>	1	-2	2	0	-1	0	1	0	8
a <sub>2</sub>	3	0	-4	0	0	-1	0	1	12
P	2 - 4M	-3 + 2M	-1 + 2M	0	M	M	0	0	-20M

Diagram 7

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>	2	3	4	1	0	0	0	0	13
a <sub>1</sub>	1	-2	2	0	-1	0	1	0	8
a <sub>2</sub>	3	0	-4	0	0	-1	0	1	12
P	2 - 4M	-3 + 2M	-1 + 2M	0	M	M	0	0	-20M

**KEY:**

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

**Diagram 8**

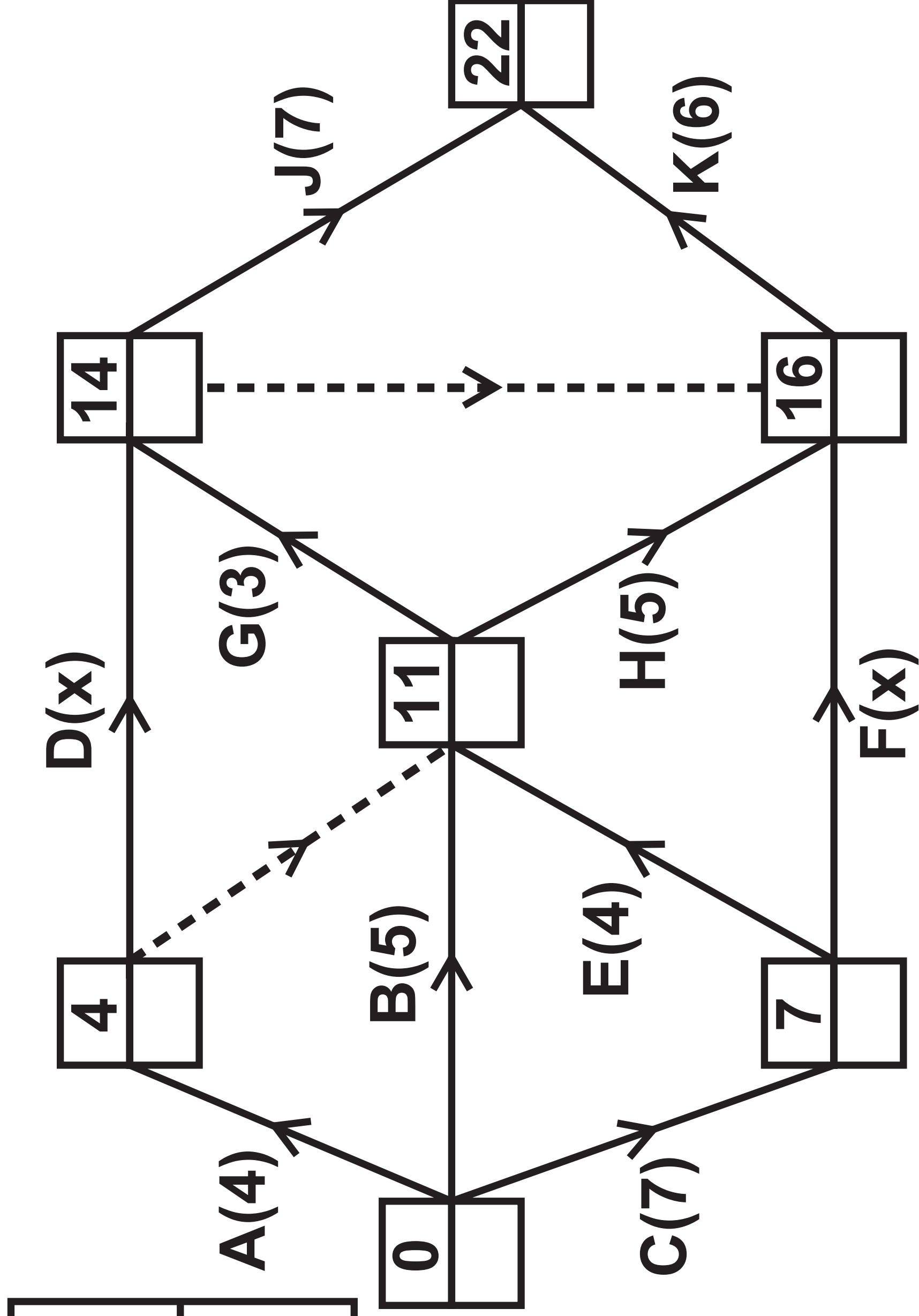
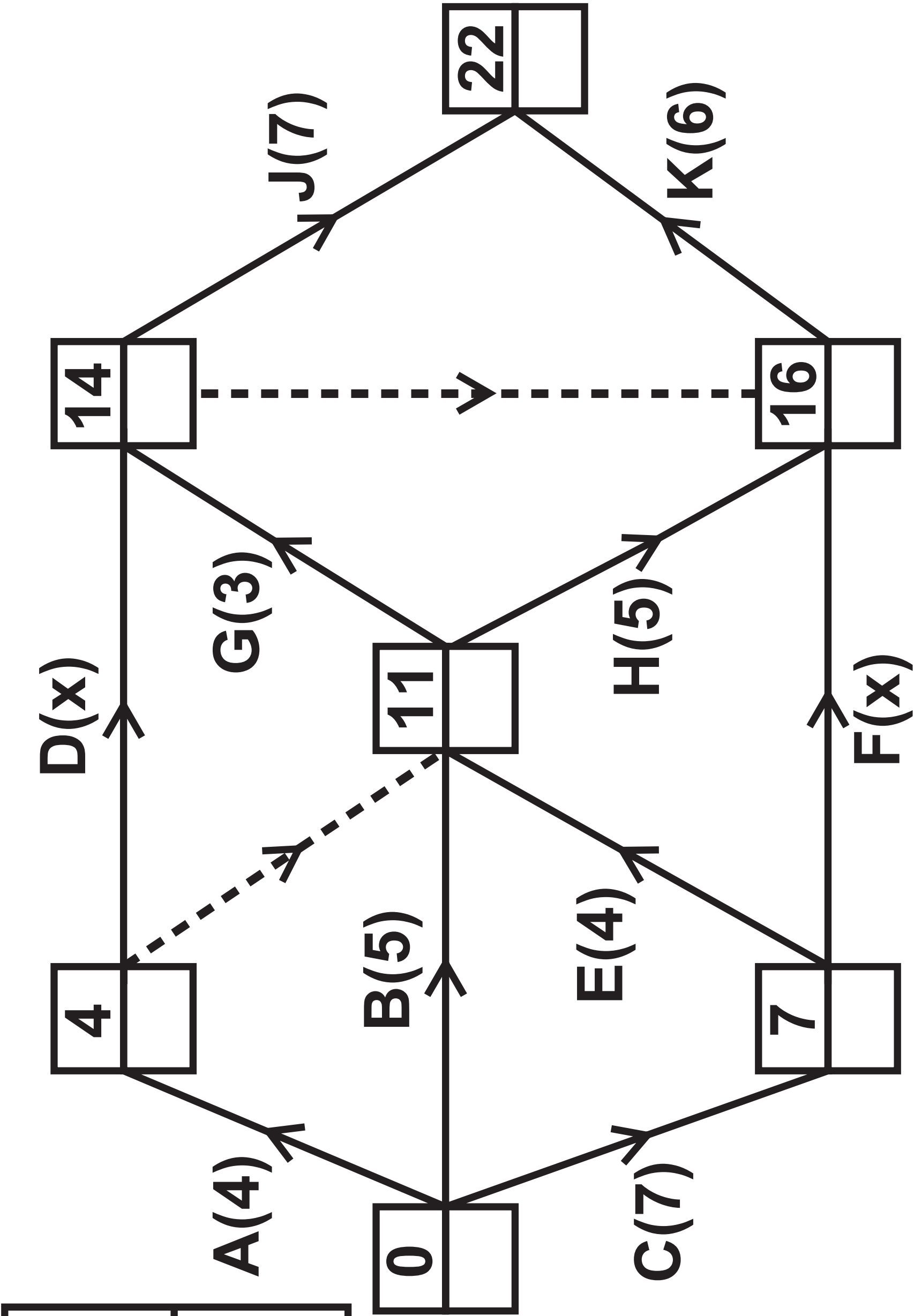


Diagram 8

**KEY:**

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



Activity	Immediately preceding activity
A	
B	
C	
D	
E	

Activity	Immediately preceding activity
F	
G	
H	
J	
K	

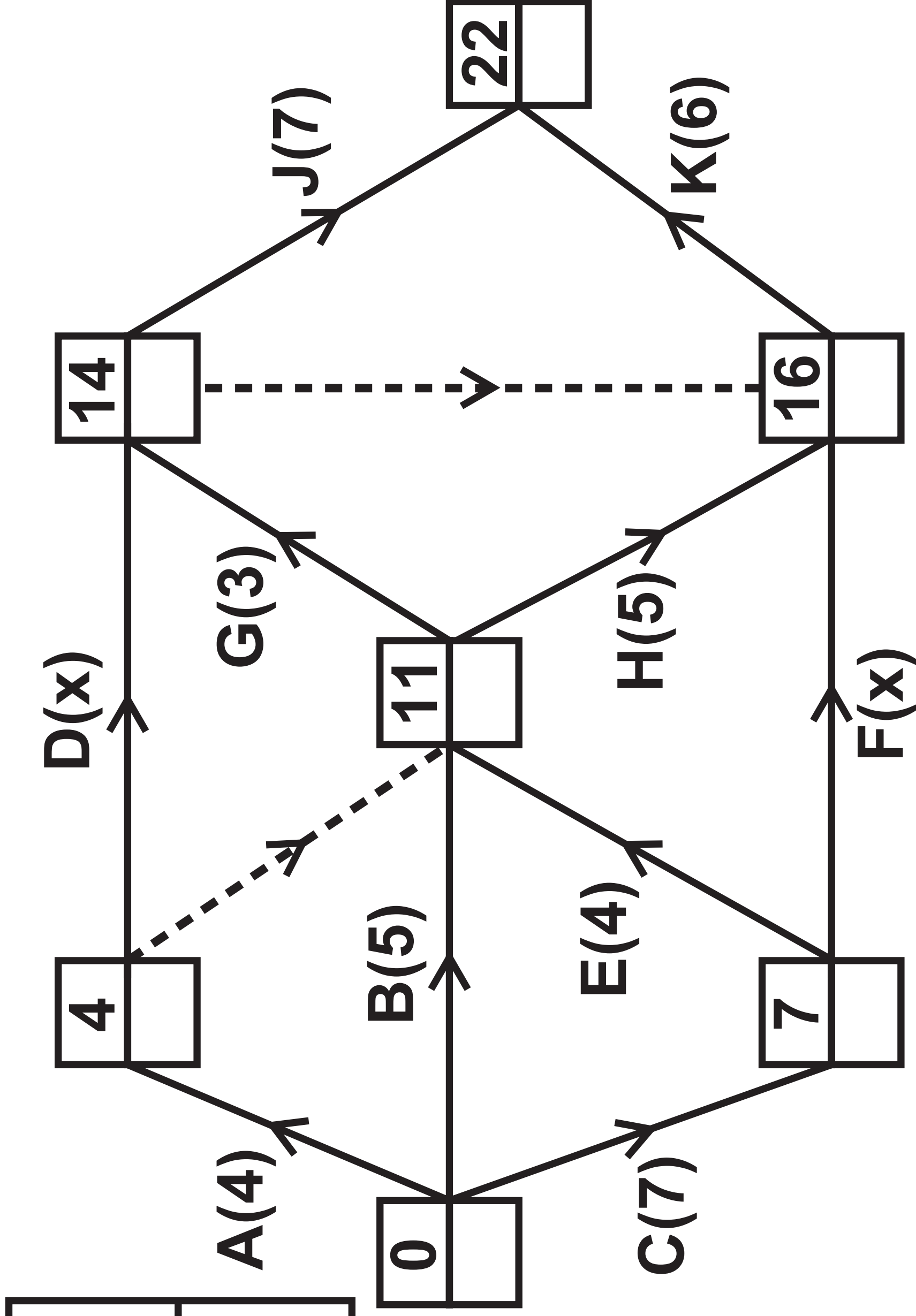
Activity	Immediately preceding activity
A	
B	
C	
D	
E	

Activity	Immediately preceding activity
F	
G	
H	
J	
K	

**KEY:**

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

**Diagram 10**





**KEY:**

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

**Diagram 10**

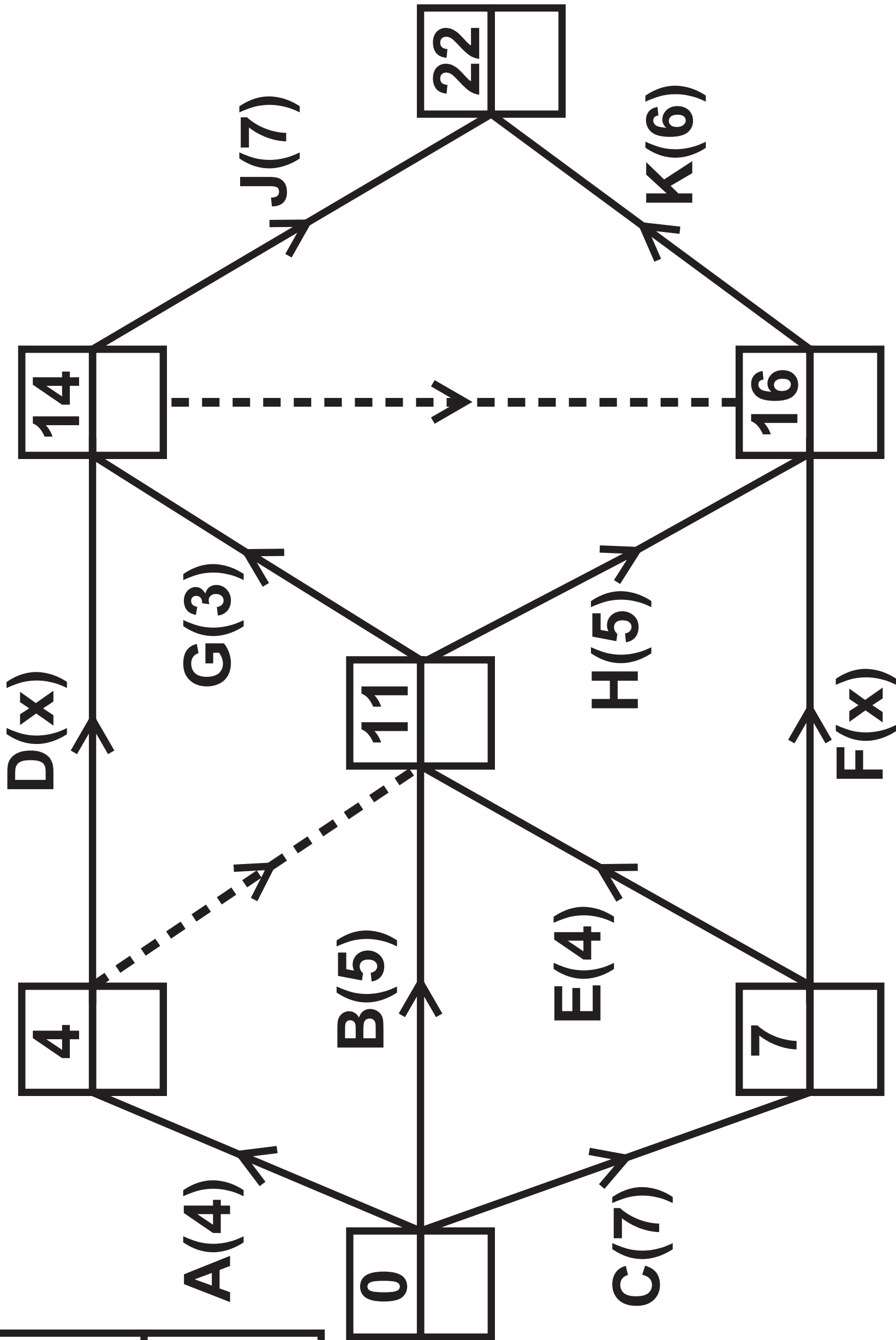


Diagram 11

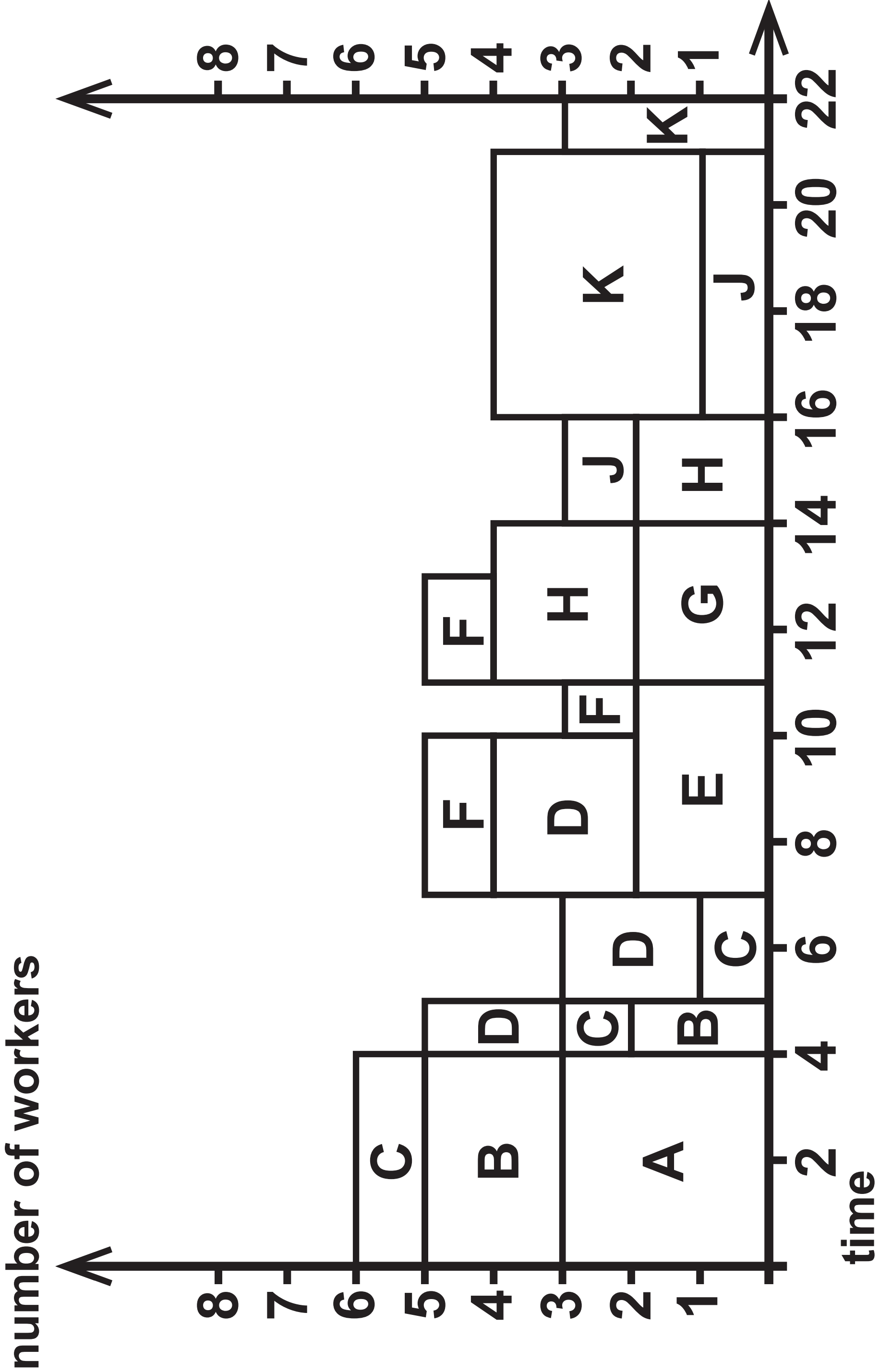


Diagram 11

number of workers

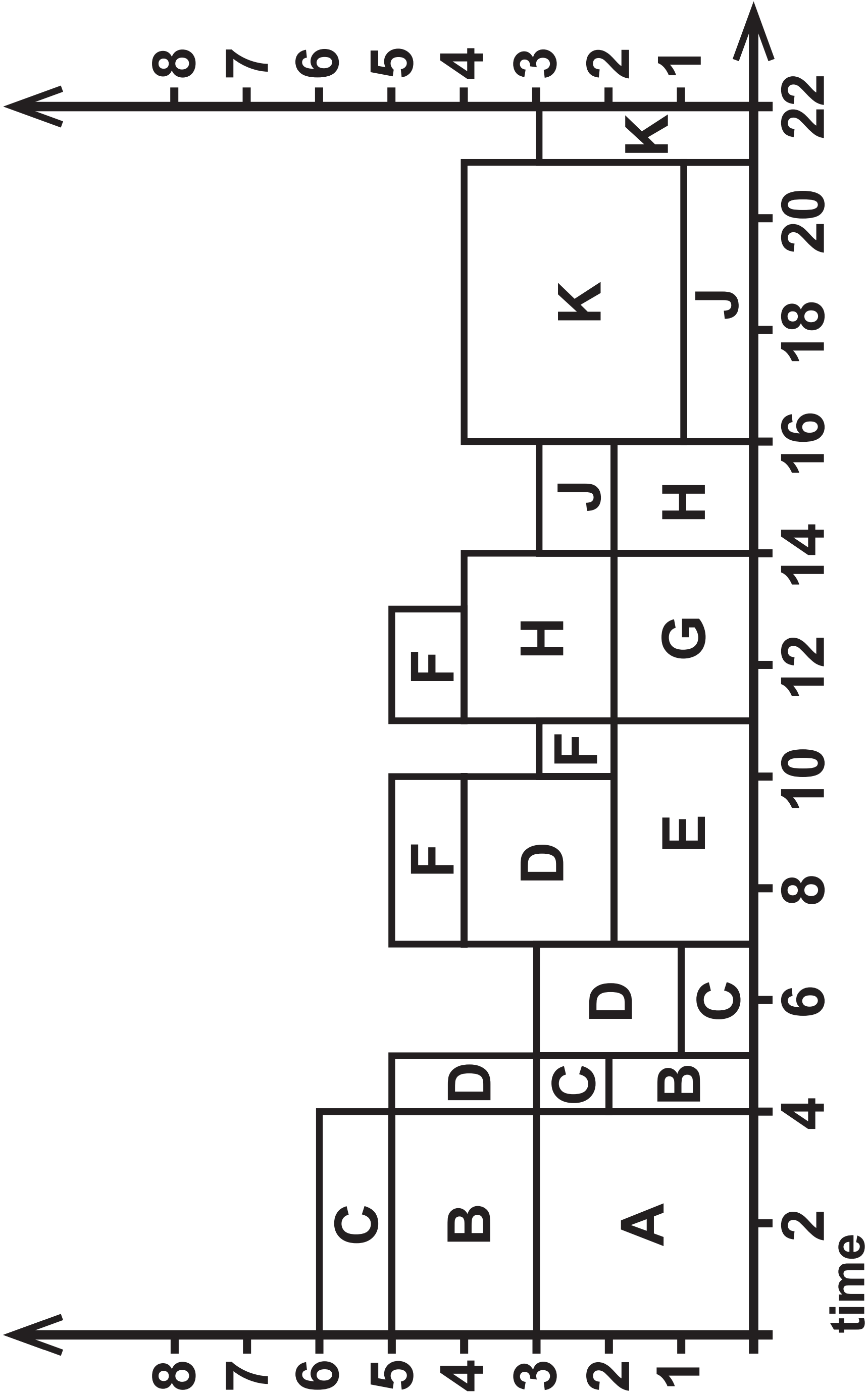


Diagram 12

Activity	Number of workers
A	
B	
C	
D	
E	

Activity	Number of workers
F	
G	
H	
J	
K	

Diagram 12

Activity	Number of workers
A	
B	
C	
D	
E	

Activity	Number of workers
F	
G	
H	
J	
K	

Diagram 13

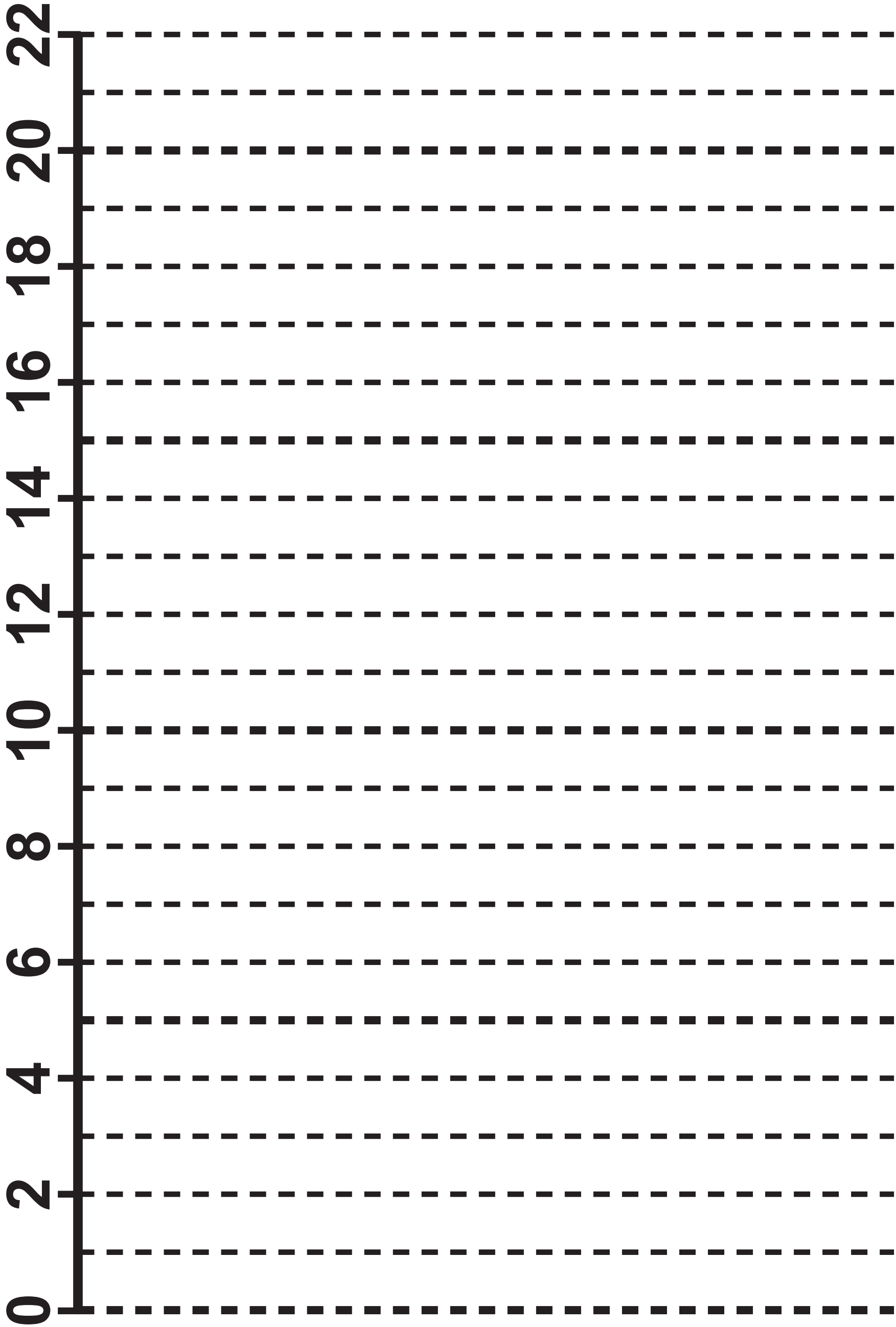


Diagram 13

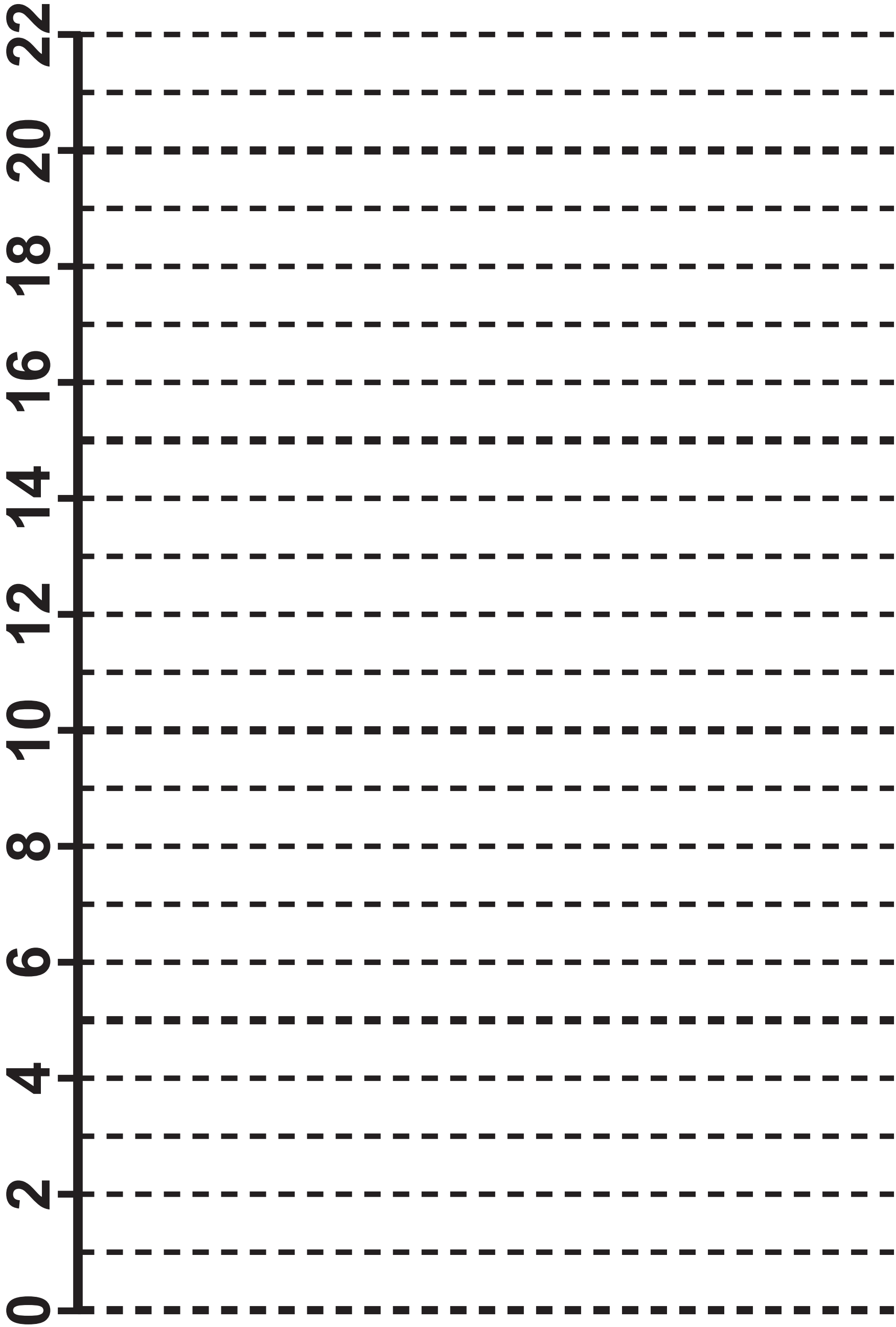


Diagram 14

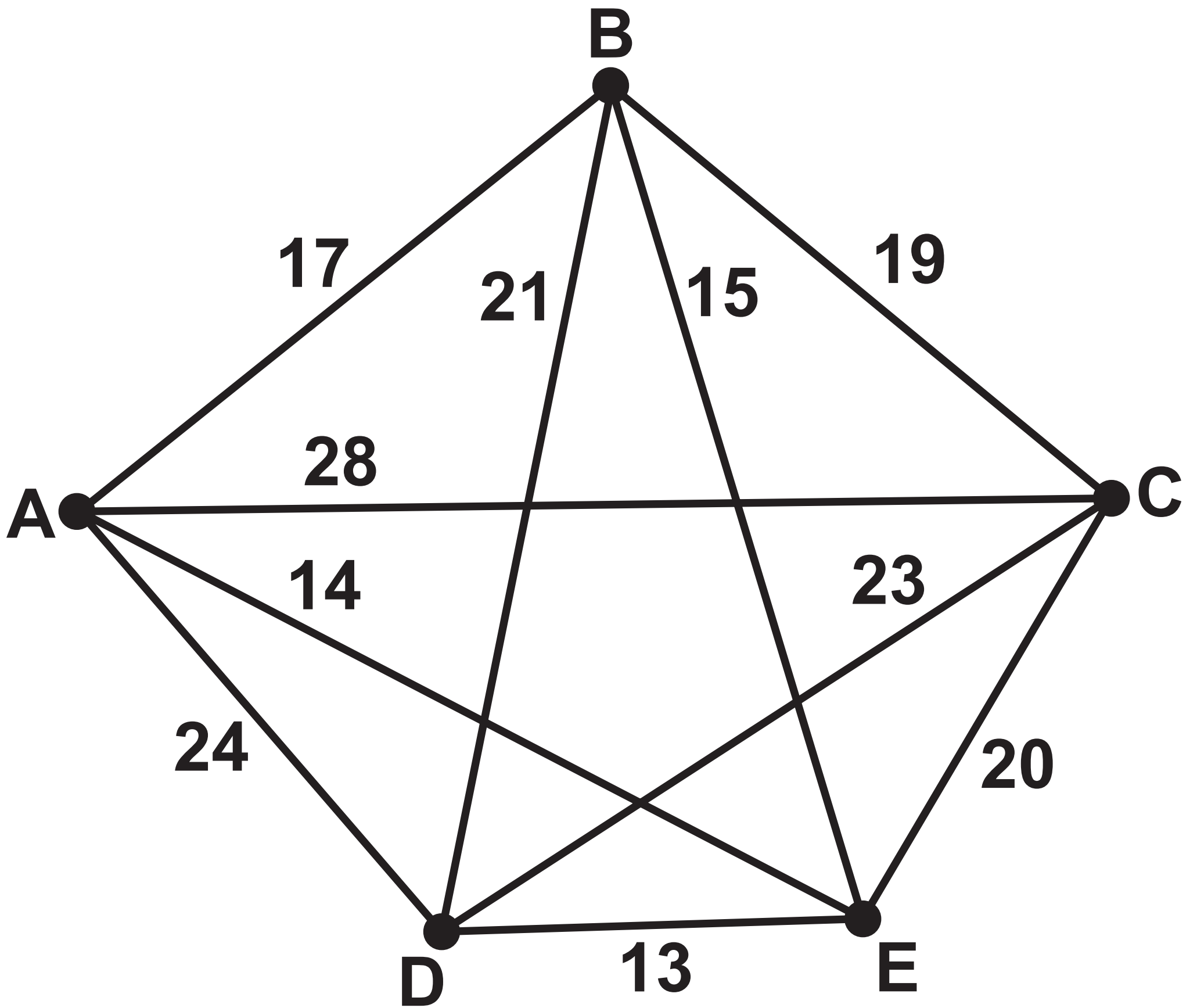




Diagram 14

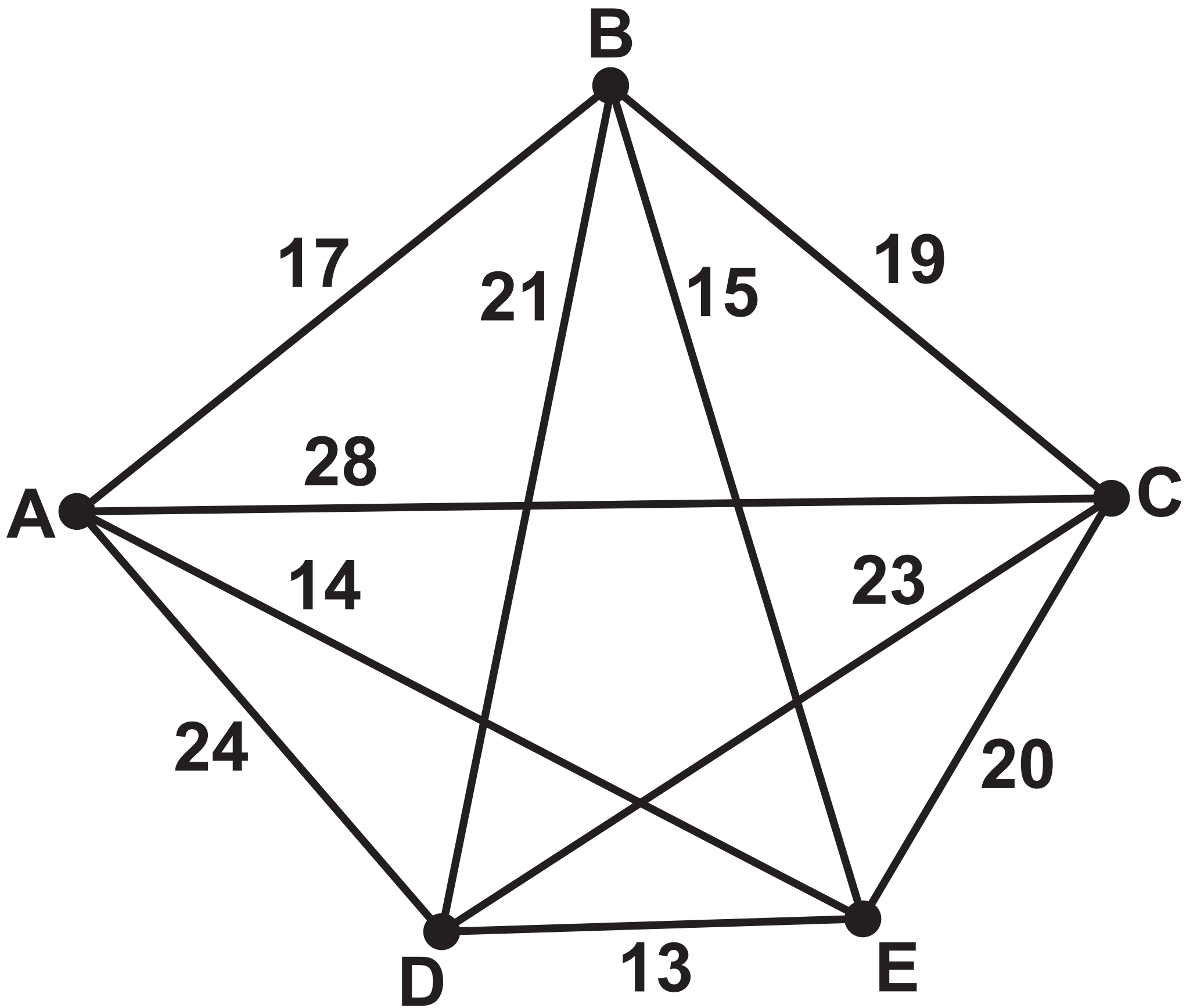


Diagram 15

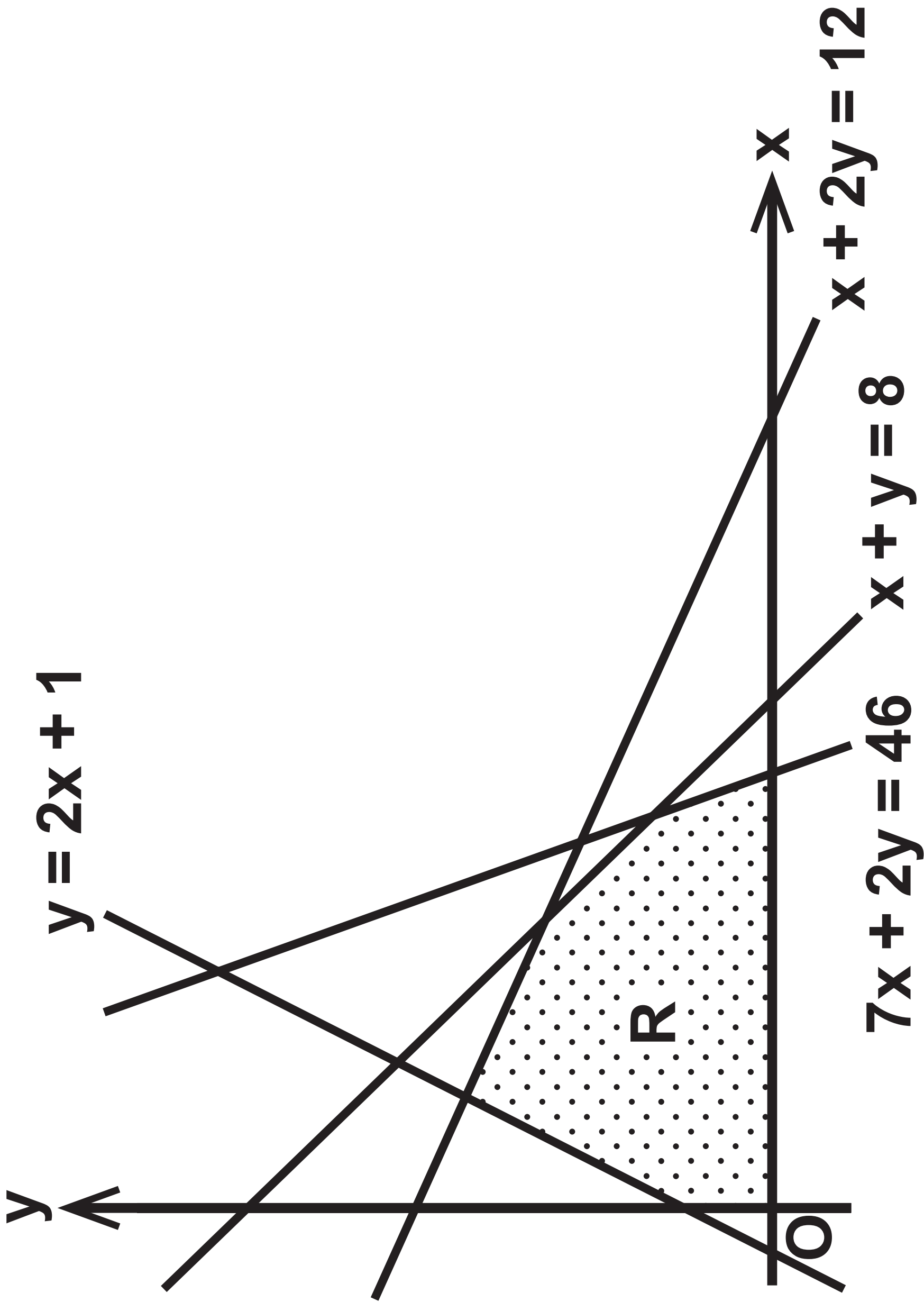


Diagram 15

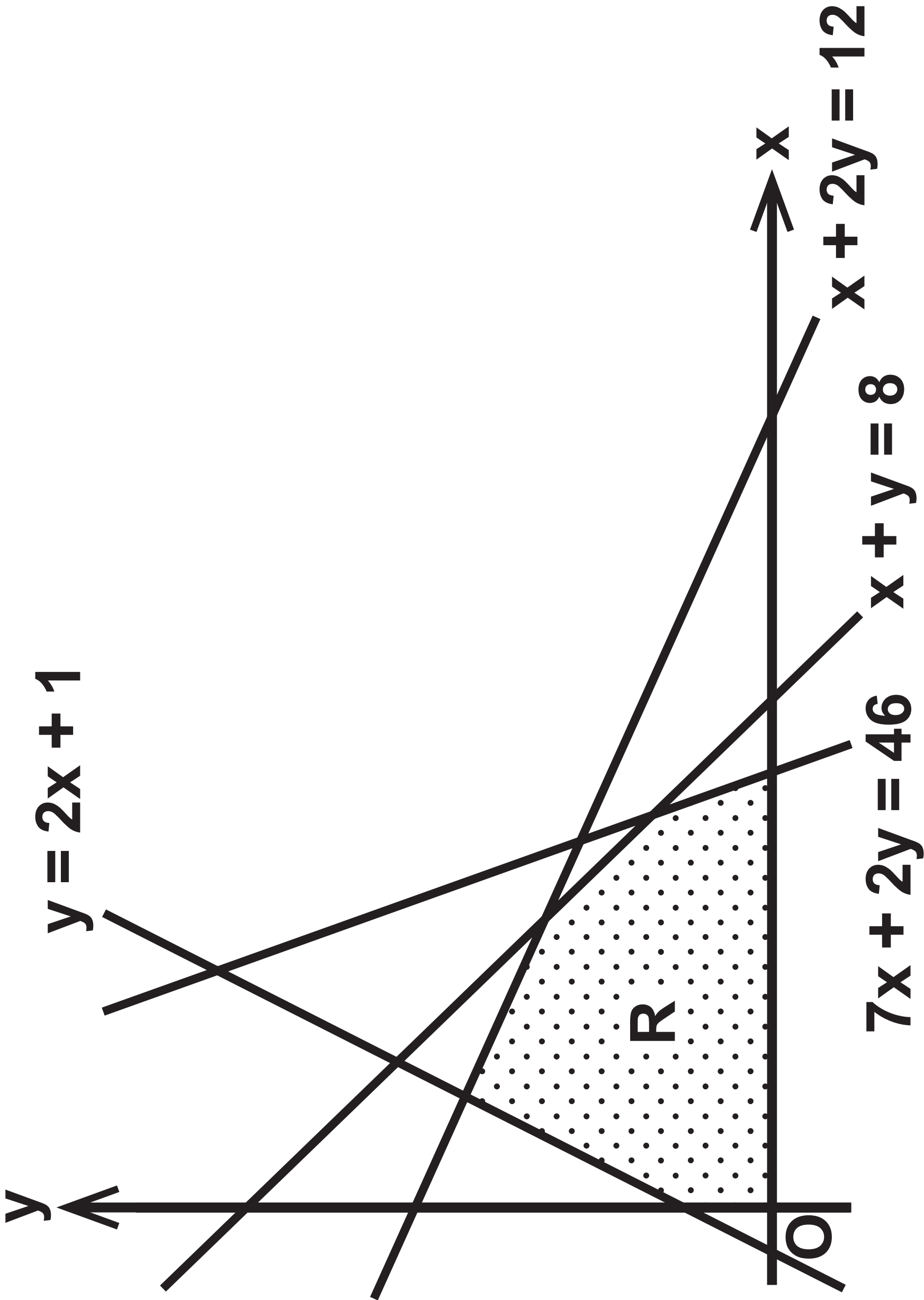


Diagram 16

b.v.	x	y	s <sub>1</sub>	s <sub>2</sub>	s <sub>3</sub>	s <sub>4</sub>	Value
s <sub>1</sub>	0	0	1	$-\frac{3}{5}$	0	$\frac{1}{5}$	1
x	1	0	0	$\frac{1}{5}$	0	$-\frac{2}{5}$	2
s <sub>3</sub>	0	0	0	$-\frac{11}{5}$	1	$\frac{12}{5}$	22
y	0	1	0	$\frac{2}{5}$	0	$\frac{1}{5}$	5
P	0	0	0	$\frac{1}{5} + \frac{2}{5}k$	0	$-\frac{2}{5} + \frac{1}{5}k$	$5k + 2$

Diagram 16

b.v.	x	y	s <sub>1</sub>	s <sub>2</sub>	s <sub>3</sub>	s <sub>4</sub>	Value
s <sub>1</sub>	0	0	1	$-\frac{3}{5}$	0	$\frac{1}{5}$	1
x	1	0	0	$\frac{1}{5}$	0	$-\frac{2}{5}$	2
s <sub>3</sub>	0	0	0	$-\frac{11}{5}$	1	$\frac{12}{5}$	22
y	0	1	0	$\frac{2}{5}$	0	$\frac{1}{5}$	5
P	0	0	0	$\frac{1}{5} + \frac{2}{5}k$	0	$-\frac{2}{5} + \frac{1}{5}k$	$5k + 2$