

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.

Surname					
Other names					
Centre Number					
Candidate Number					

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]

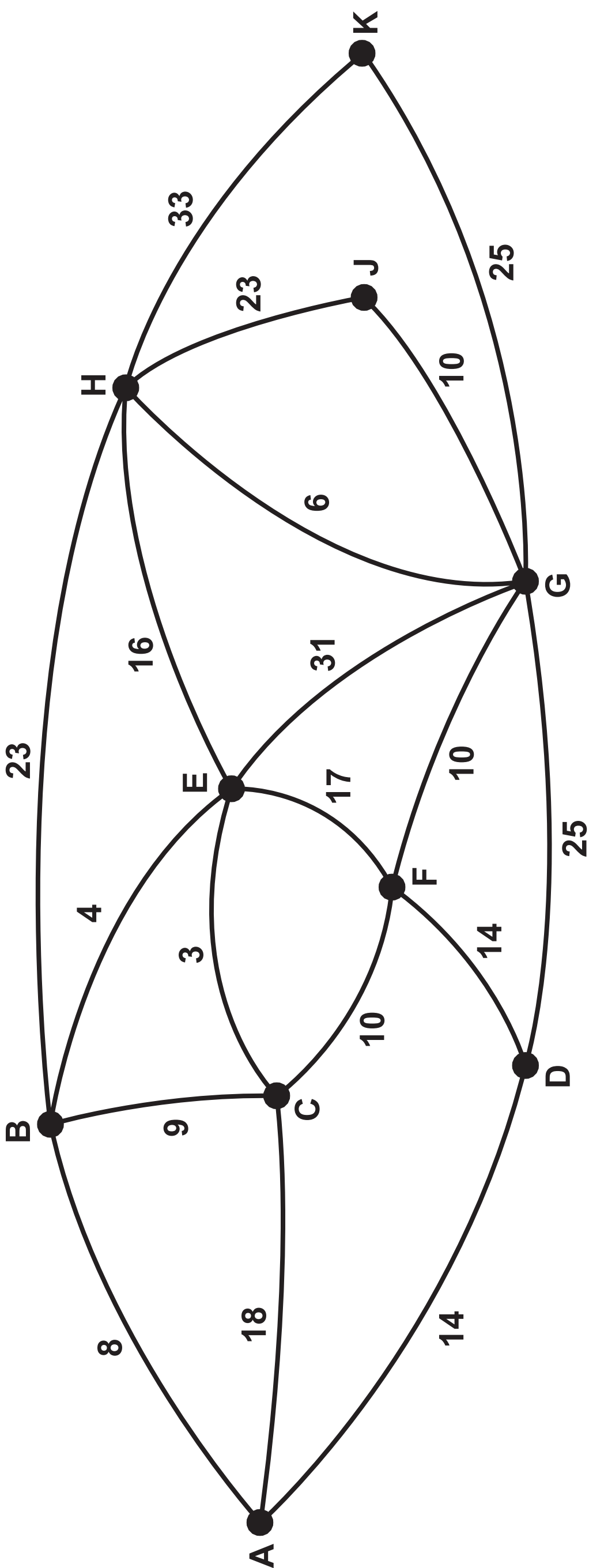


Diagram 1

[The total weight of the network is 299]

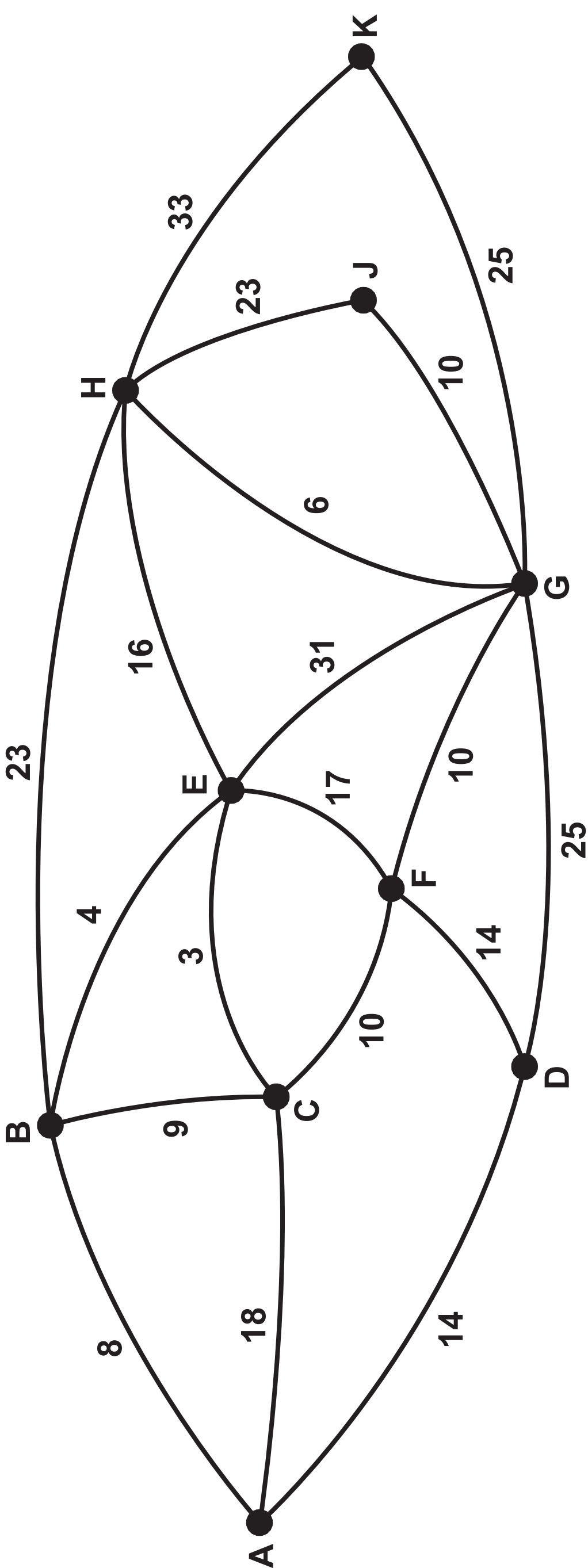
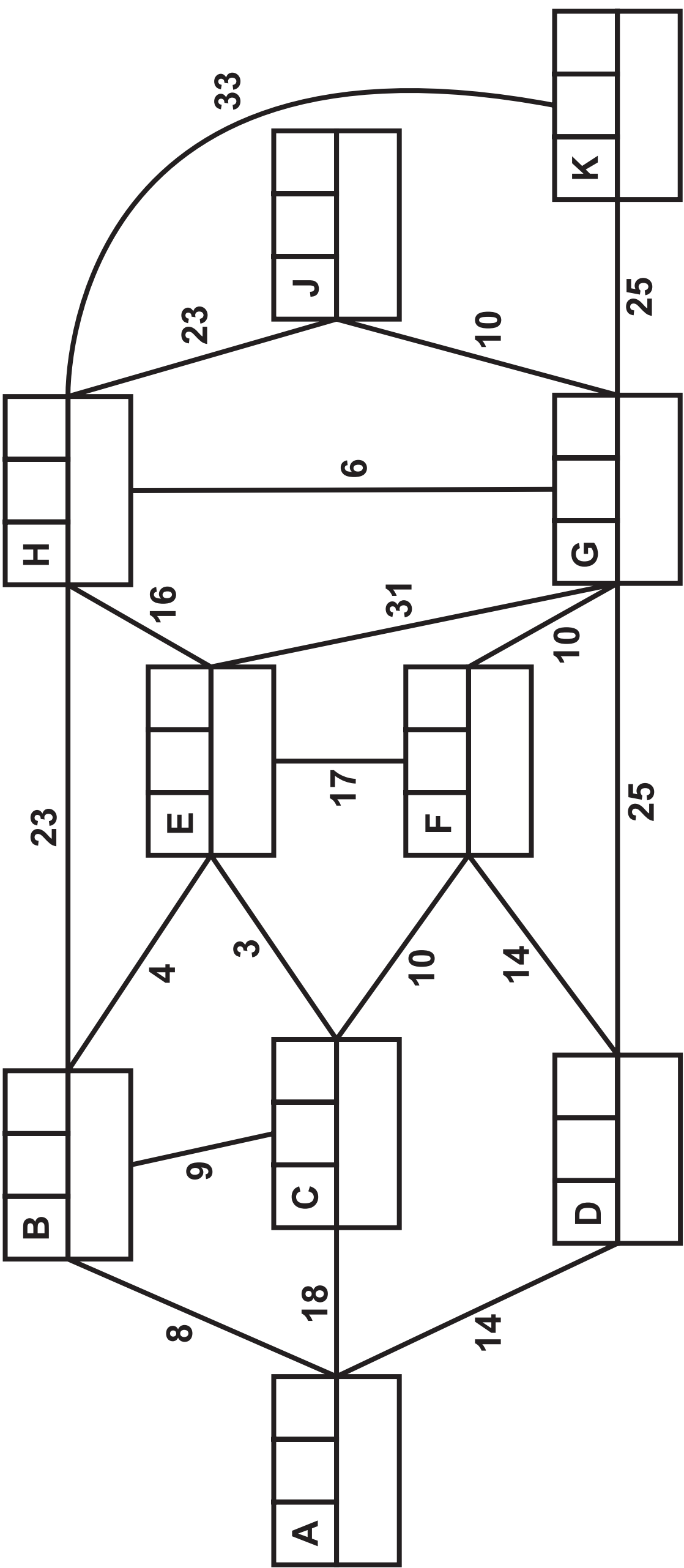


Diagram 2

KEY:

Vertex	Order of labelling	Final value
Working value		



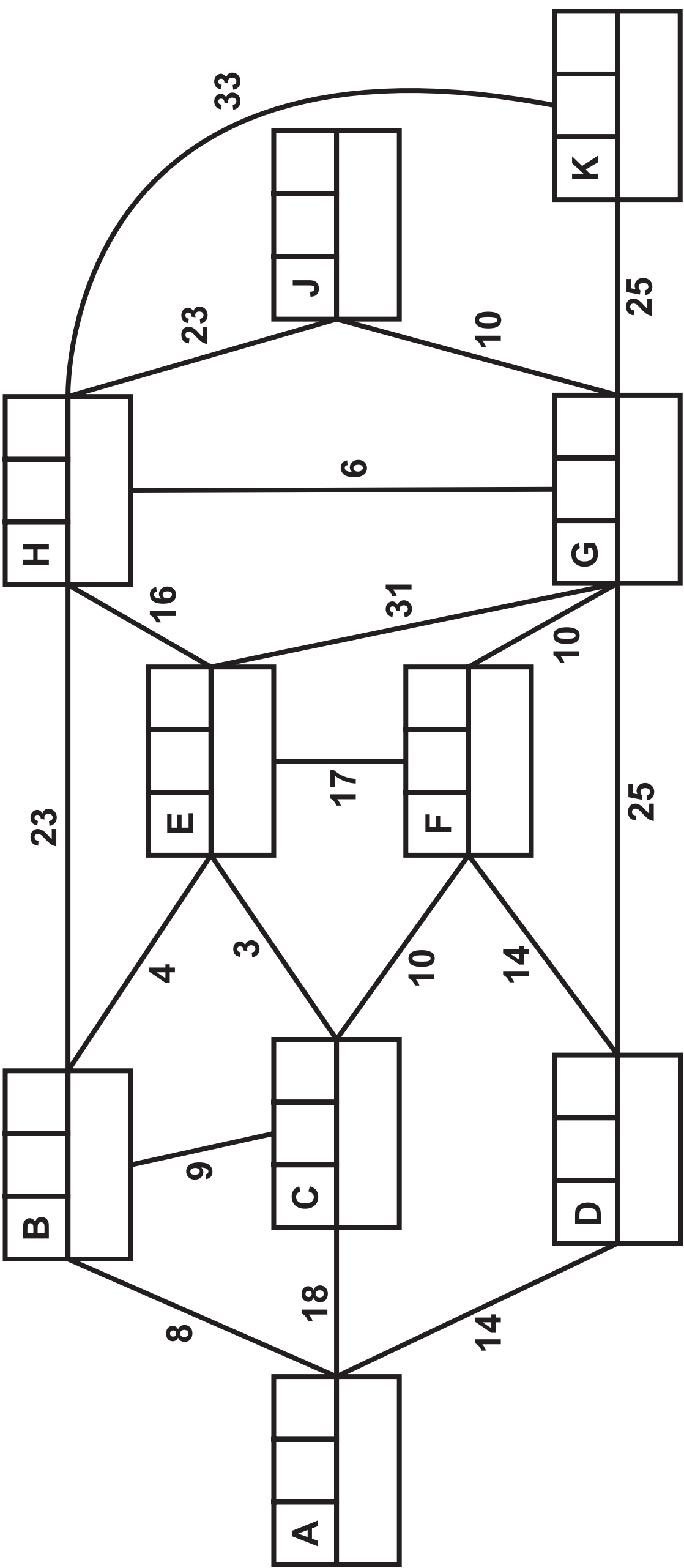
Shortest path from A to K: _____

Length of shortest path from A to K: _____

Diagram 2

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	∞	∞
C	32	17	–	4	12	∞
D	24	∞	4	–	∞	13
E	∞	∞	12	18	–	12
F	11	∞	∞	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

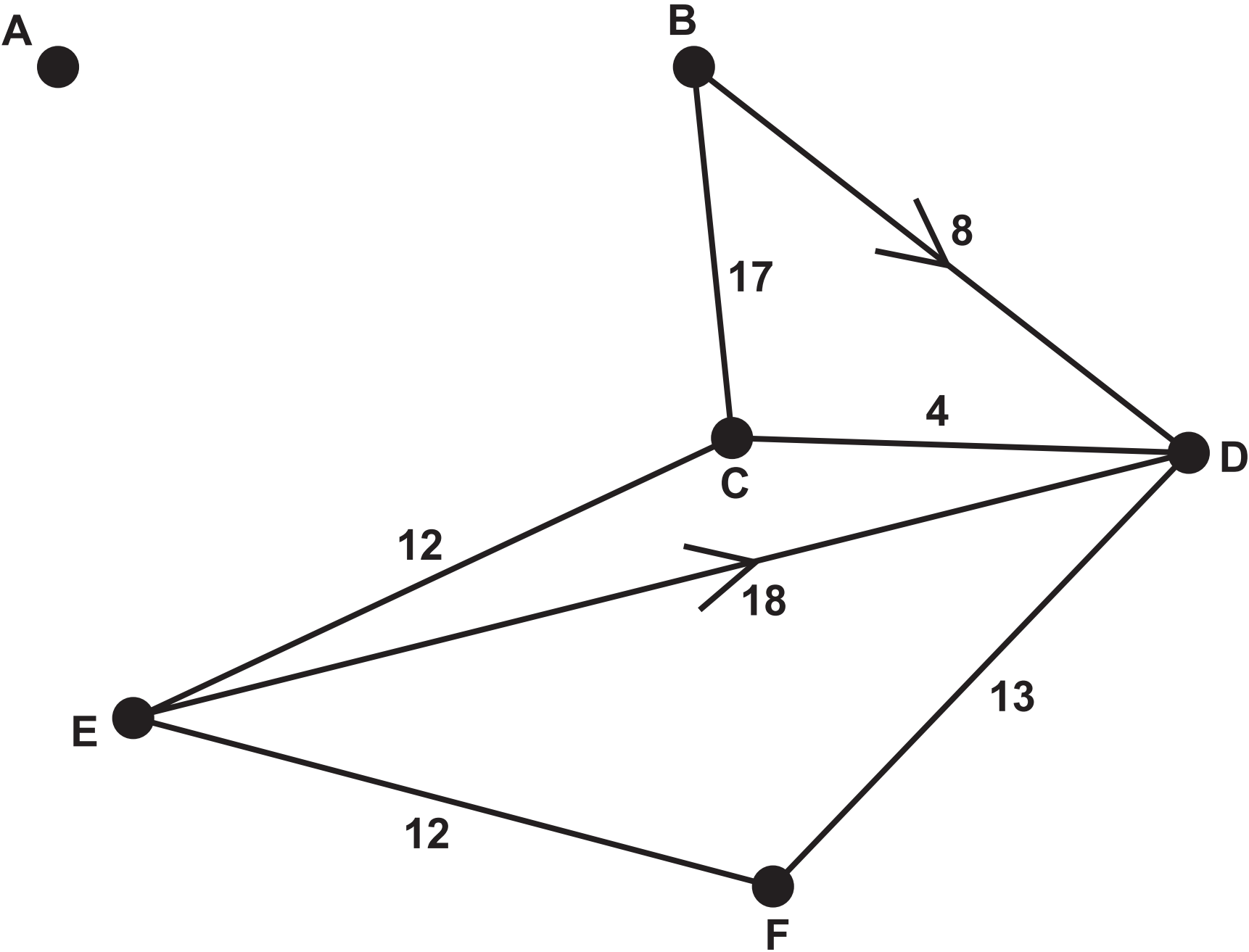


Diagram 4

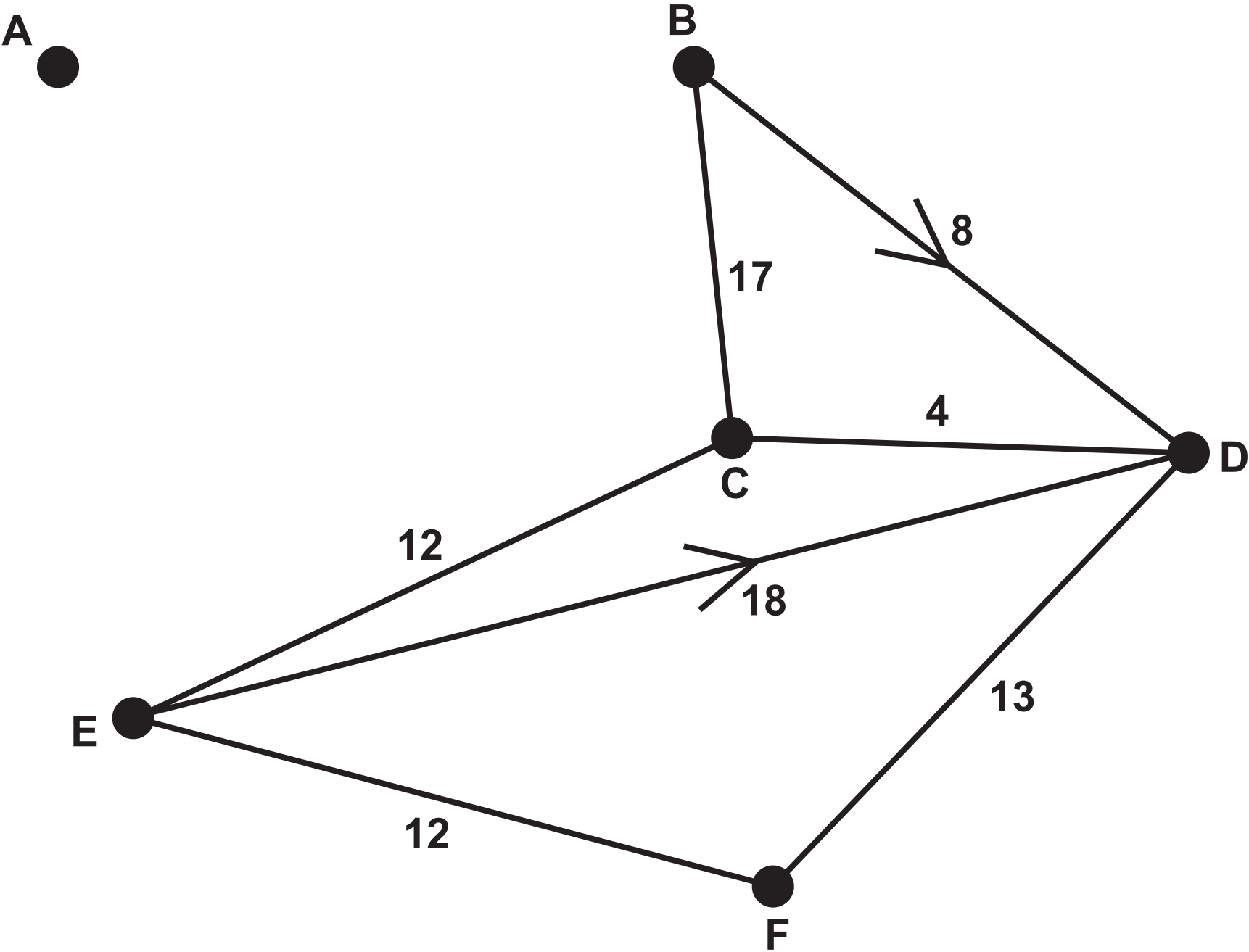


Diagram 5

	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	∞	∞	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	∞	∞	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	–

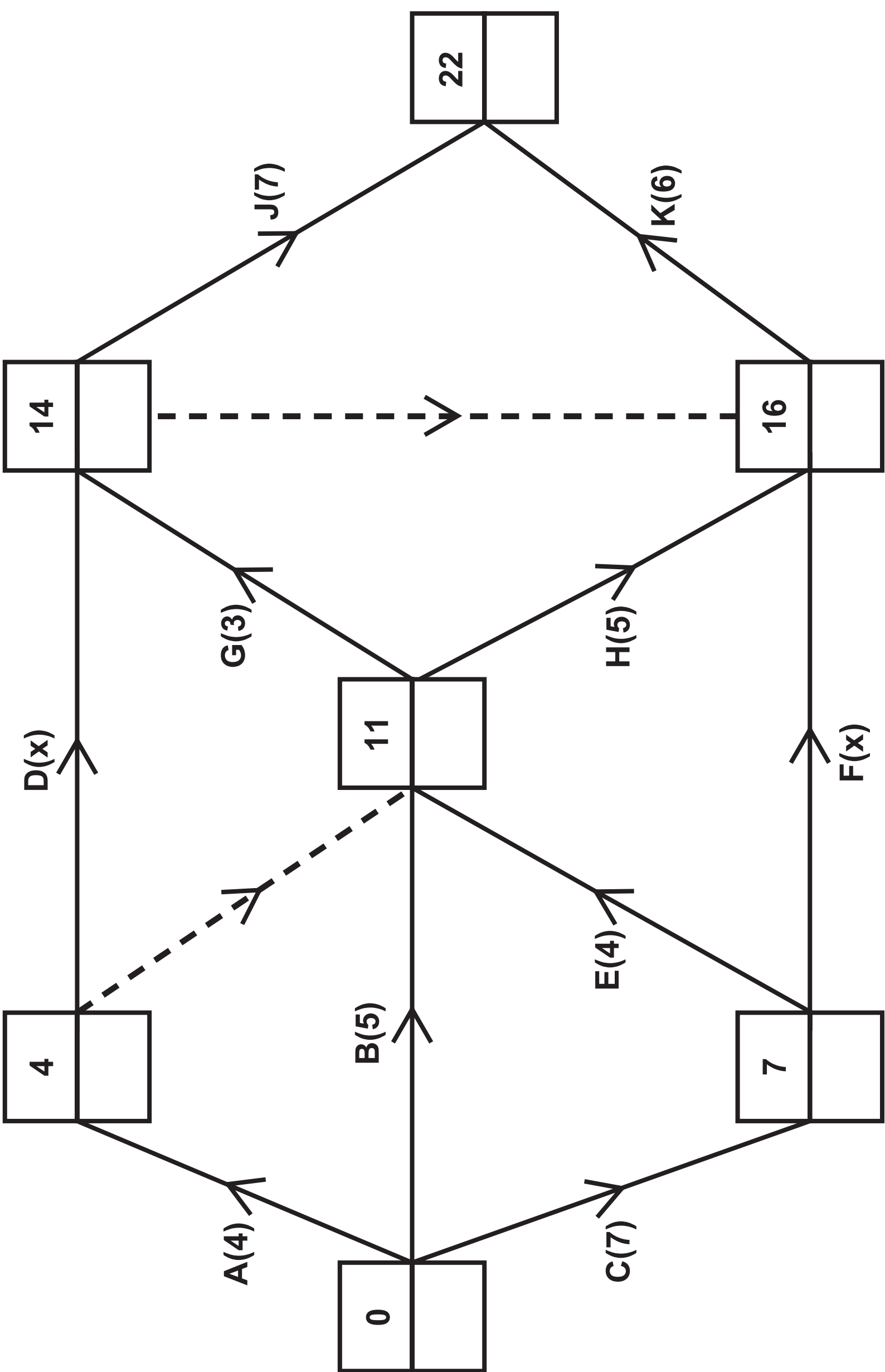
b.v.	x	y	z	s ₁	s ₂	s ₃	a ₁	a ₂	Value
s ₁	2	3	4	1	0	0	0	0	13
a ₁	1	-2	2	0	-1	0	1	0	8
a ₂	3	0	-4	0	0	-1	0	1	12
P	2 - 4M	-3 + 2M	-1 + 2M	0	M	M	0	0	-20M

b.v.	x	y	z	s ₁	s ₂	s ₃	a ₁	a ₂	Value
s ₁	2	3	4	1	0	0	0	0	13
a ₁	1	-2	2	0	-1	0	1	0	8
a ₂	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



KEY:

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

Diagram 8

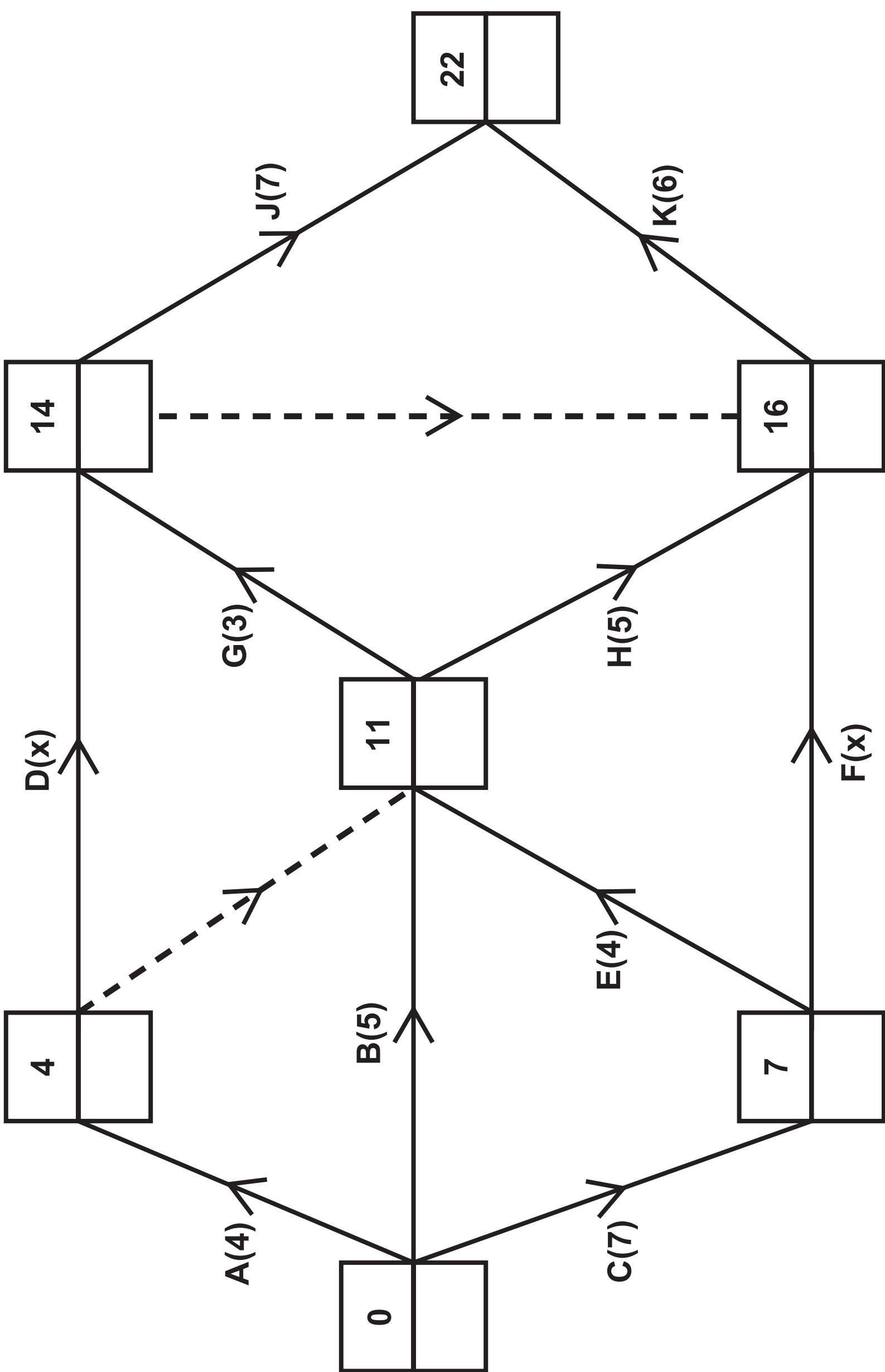


Diagram 9

Activity	Immediately preceding activity	Activity	Immediately preceding activity
A		F	
B		G	
C		H	
D		J	
E		K	

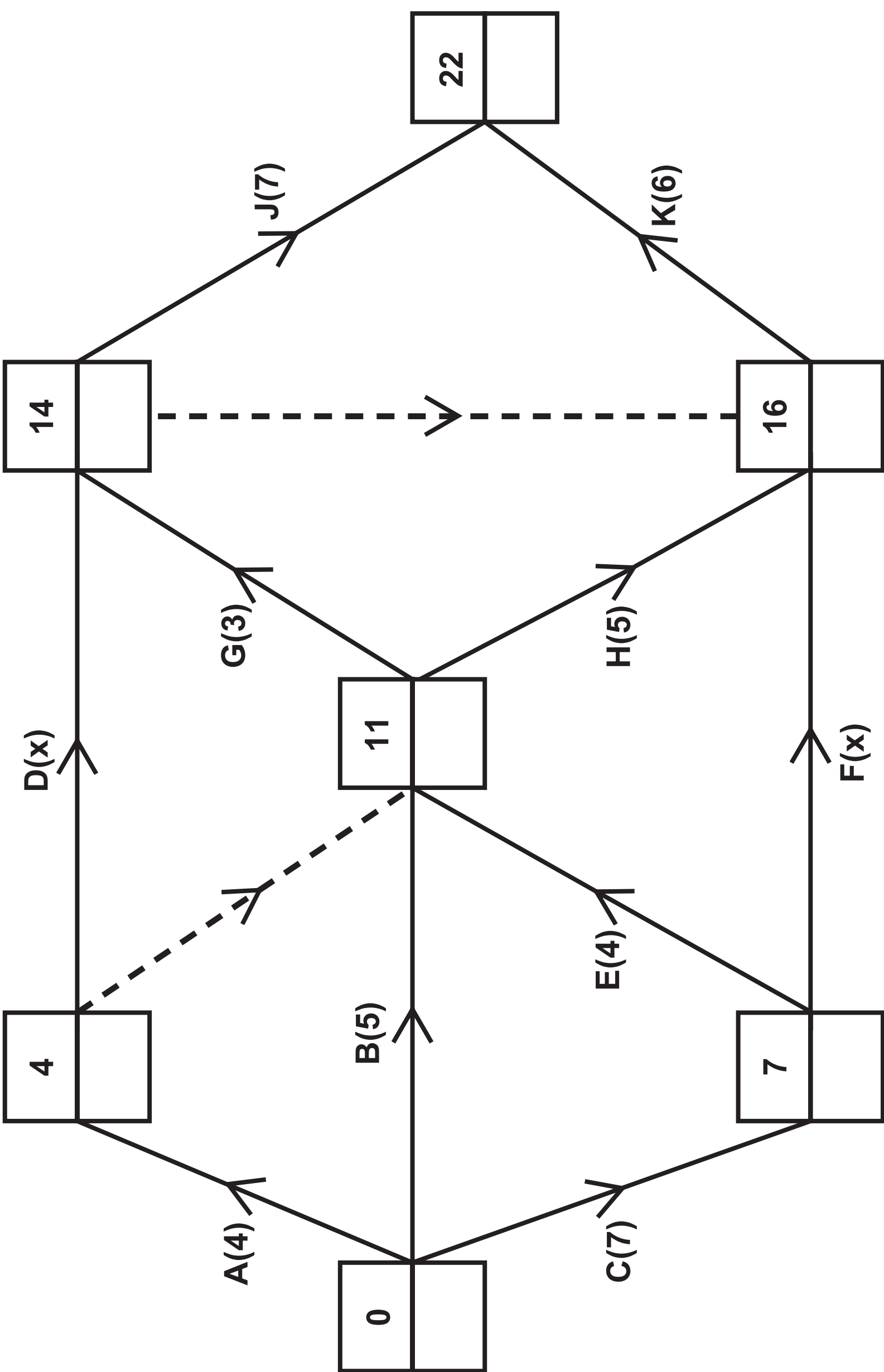
Diagram 9

Activity	Immediately preceding activity	Activity	Immediately preceding activity
A		F	
B		G	
C		H	
D		J	
E		K	

KEY:

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

Diagram 10



KEY:

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

Diagram 10

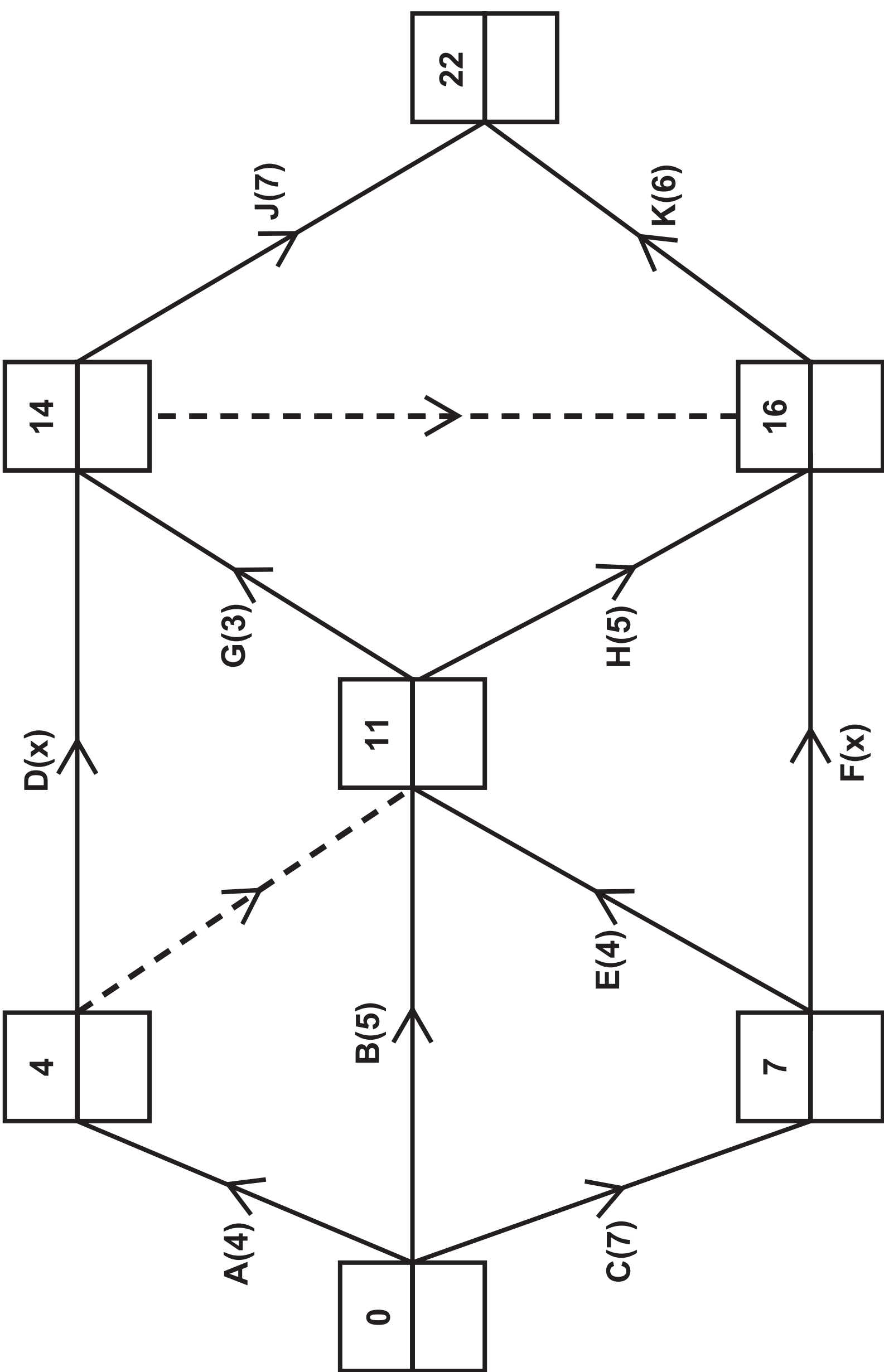


Diagram 11

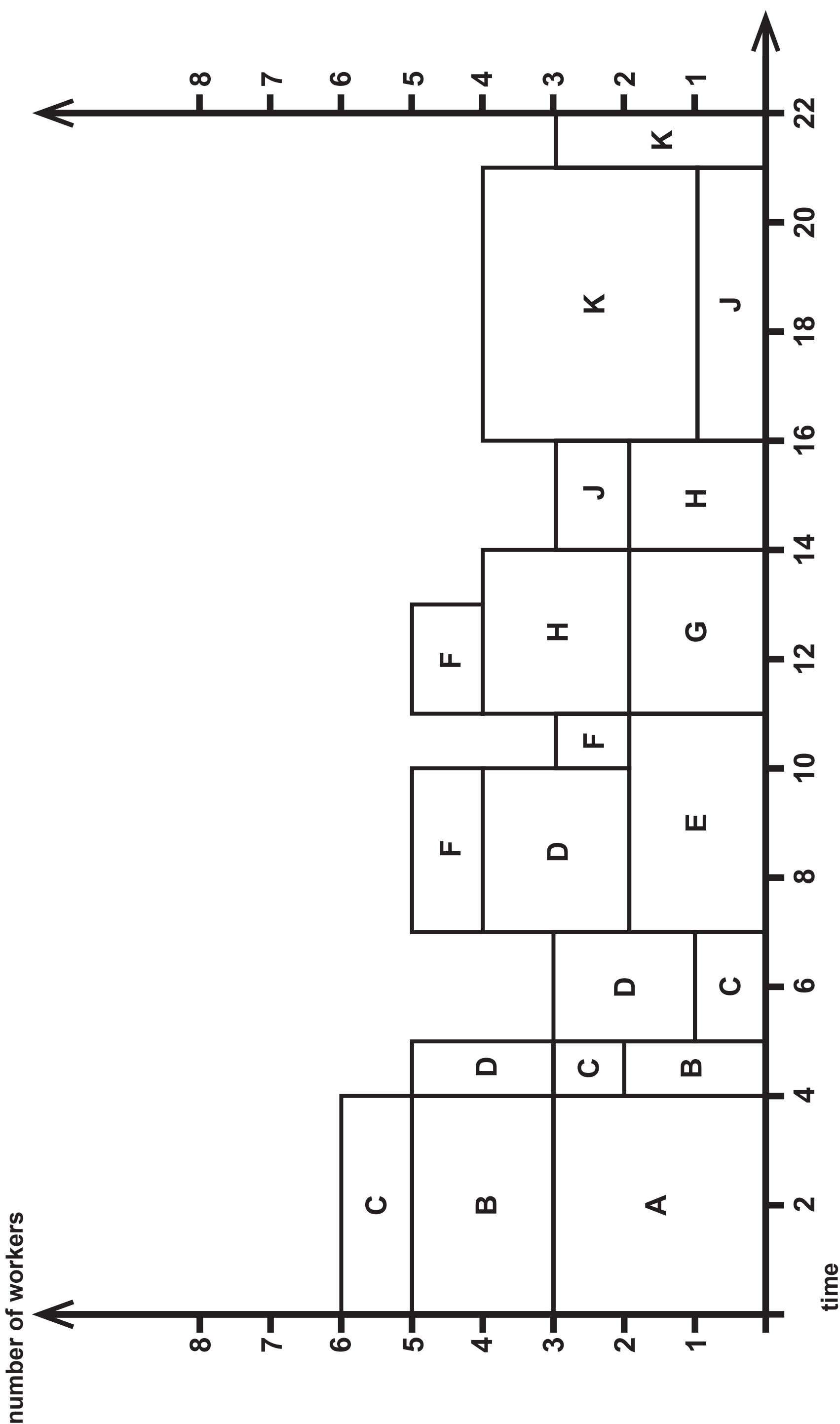


Diagram 11

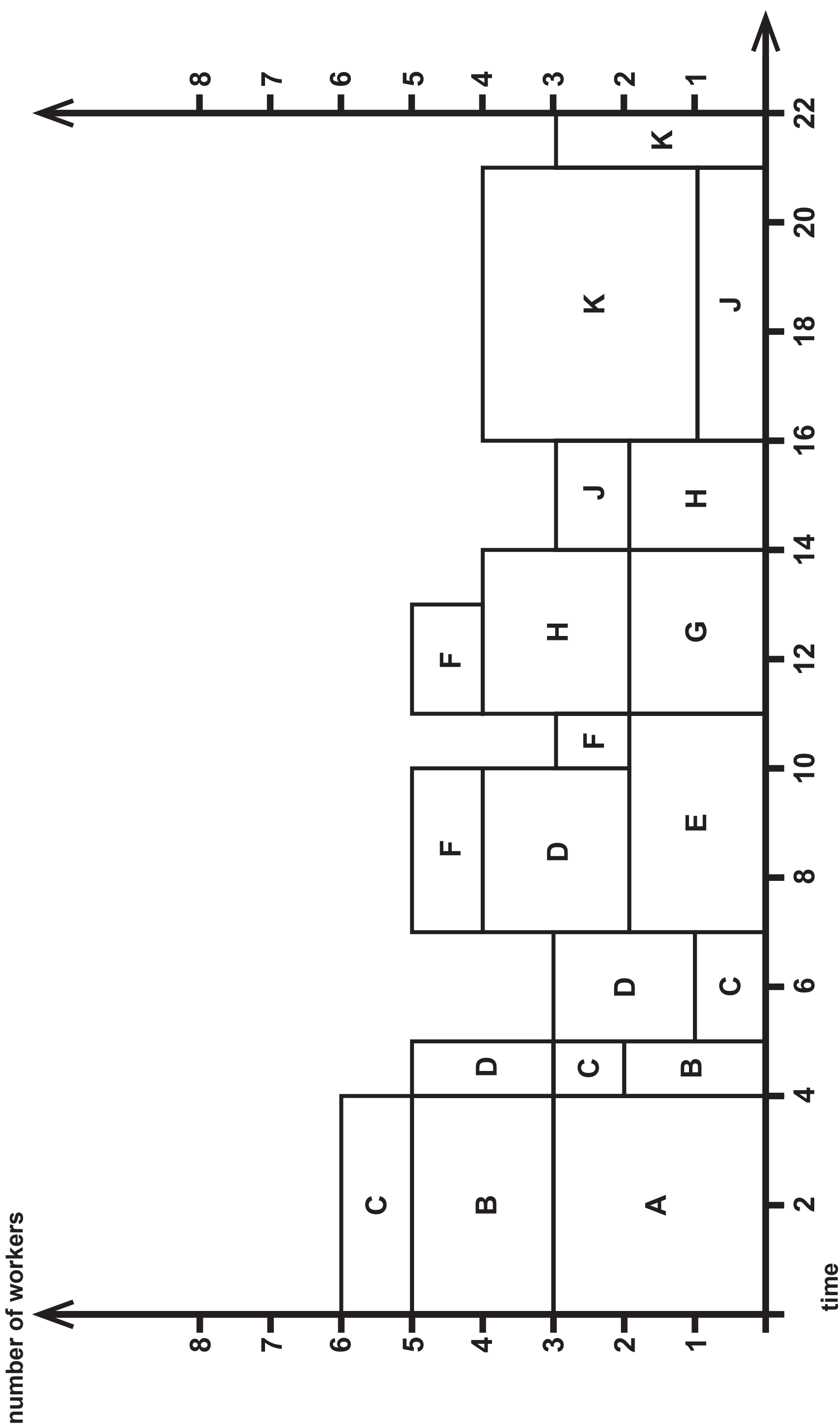


Diagram 12

Activity	Number of workers	Activity	Number of workers
A		F	
B		G	
C		H	
D		J	
E		K	

Diagram 12

Activity	Number of workers	Activity	Number of workers
A		F	
B		G	
C		H	
D		J	
E		K	

Diagram 13

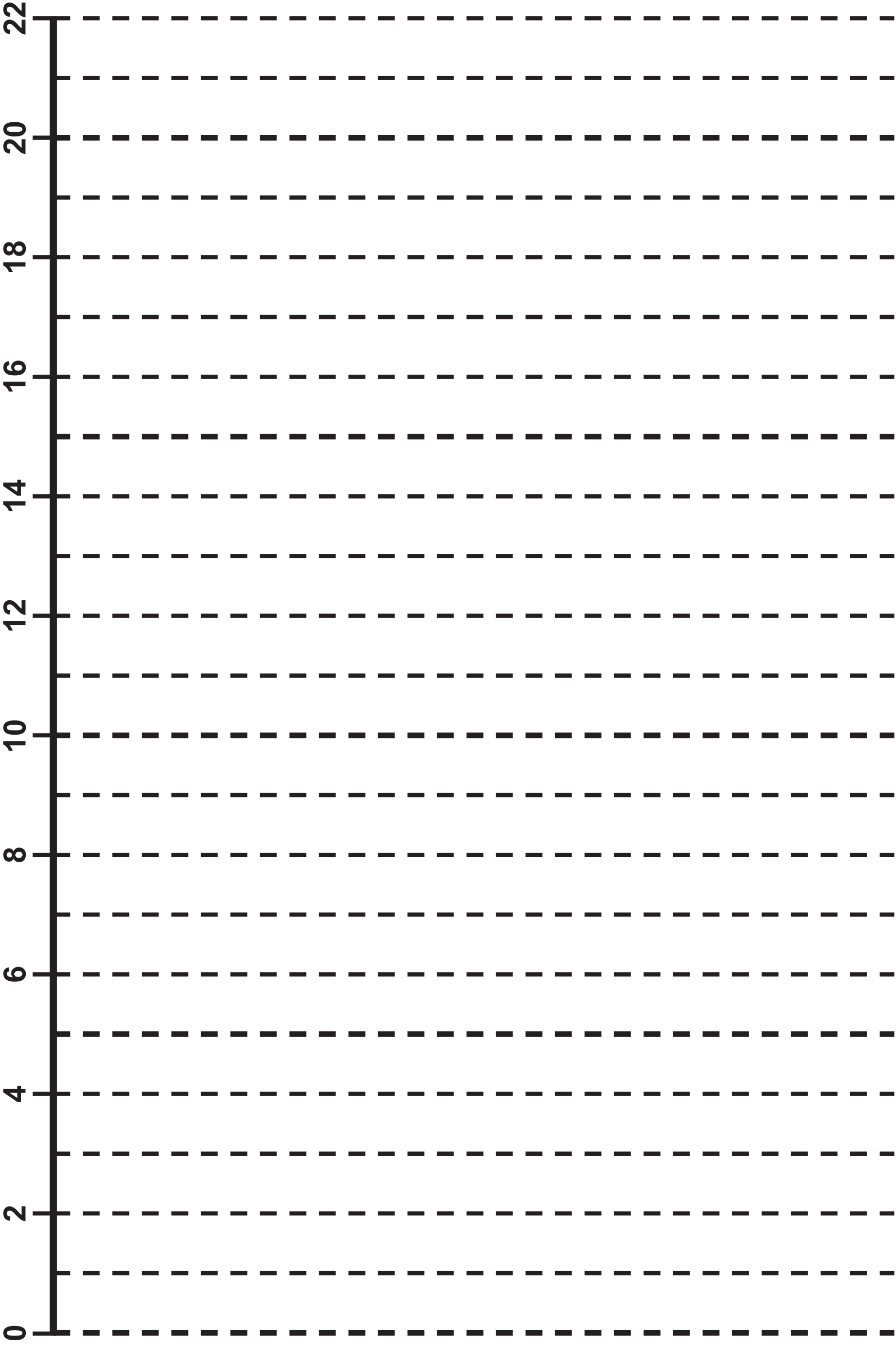


Diagram 13

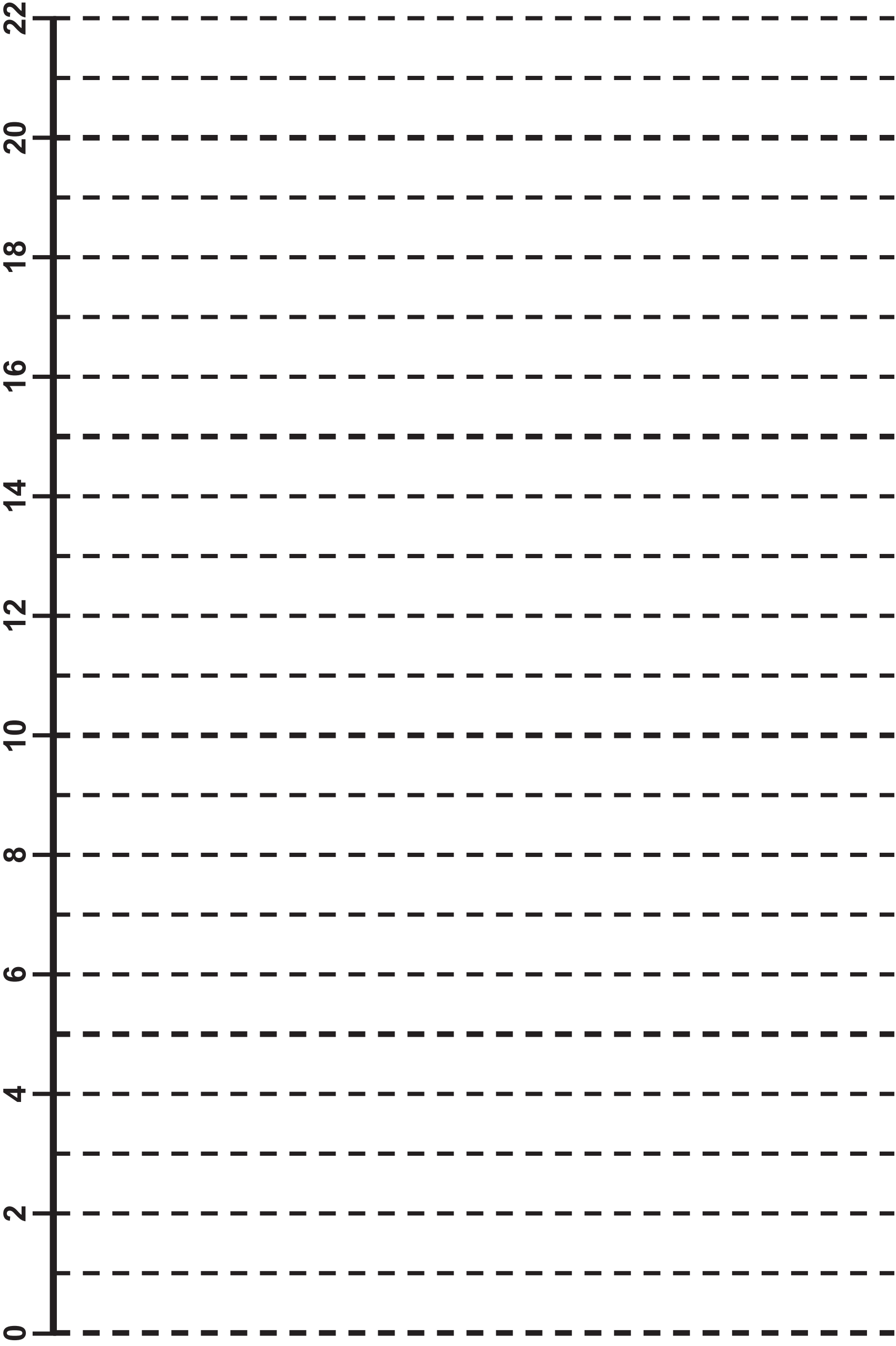


Diagram 14

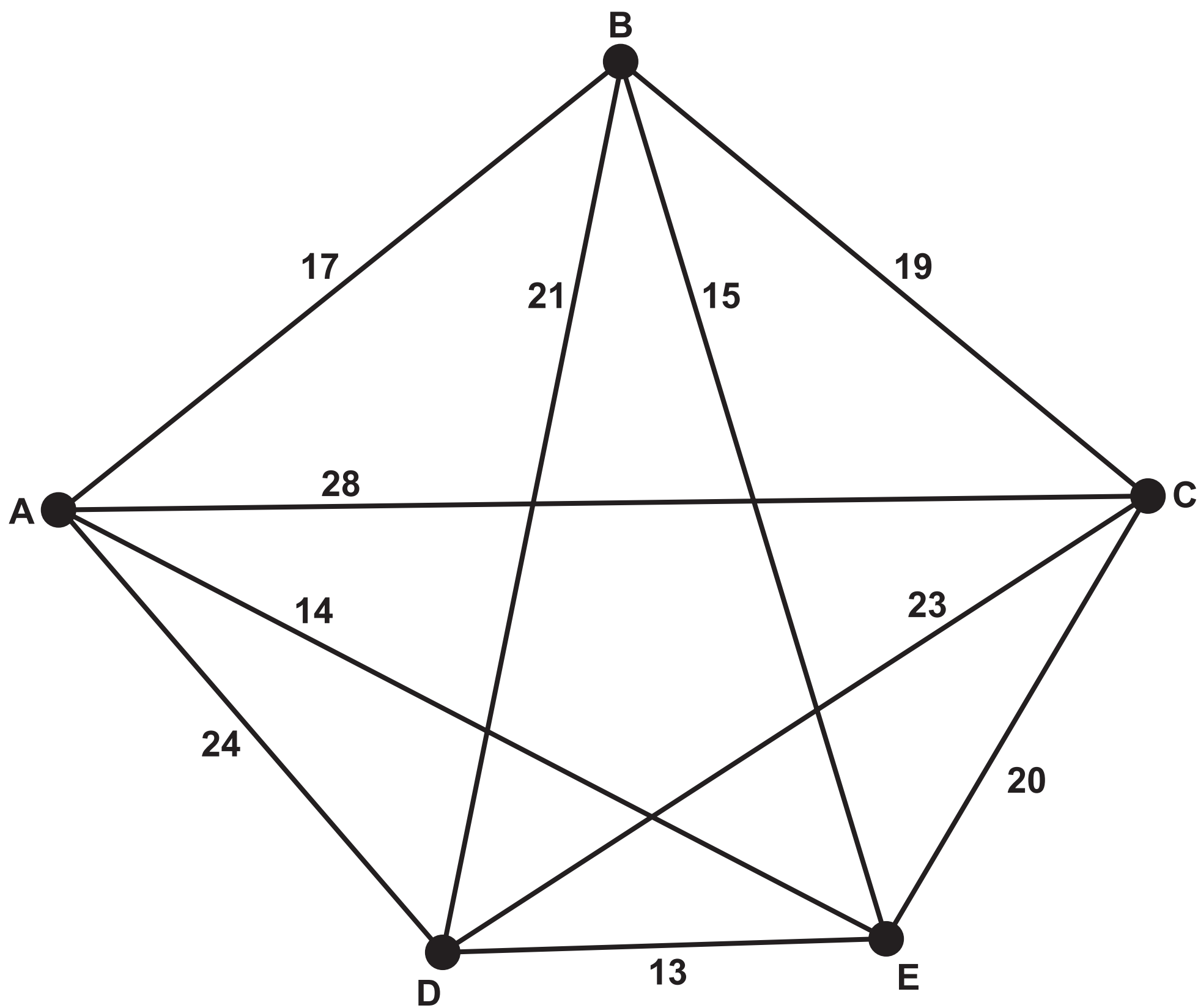


Diagram 14

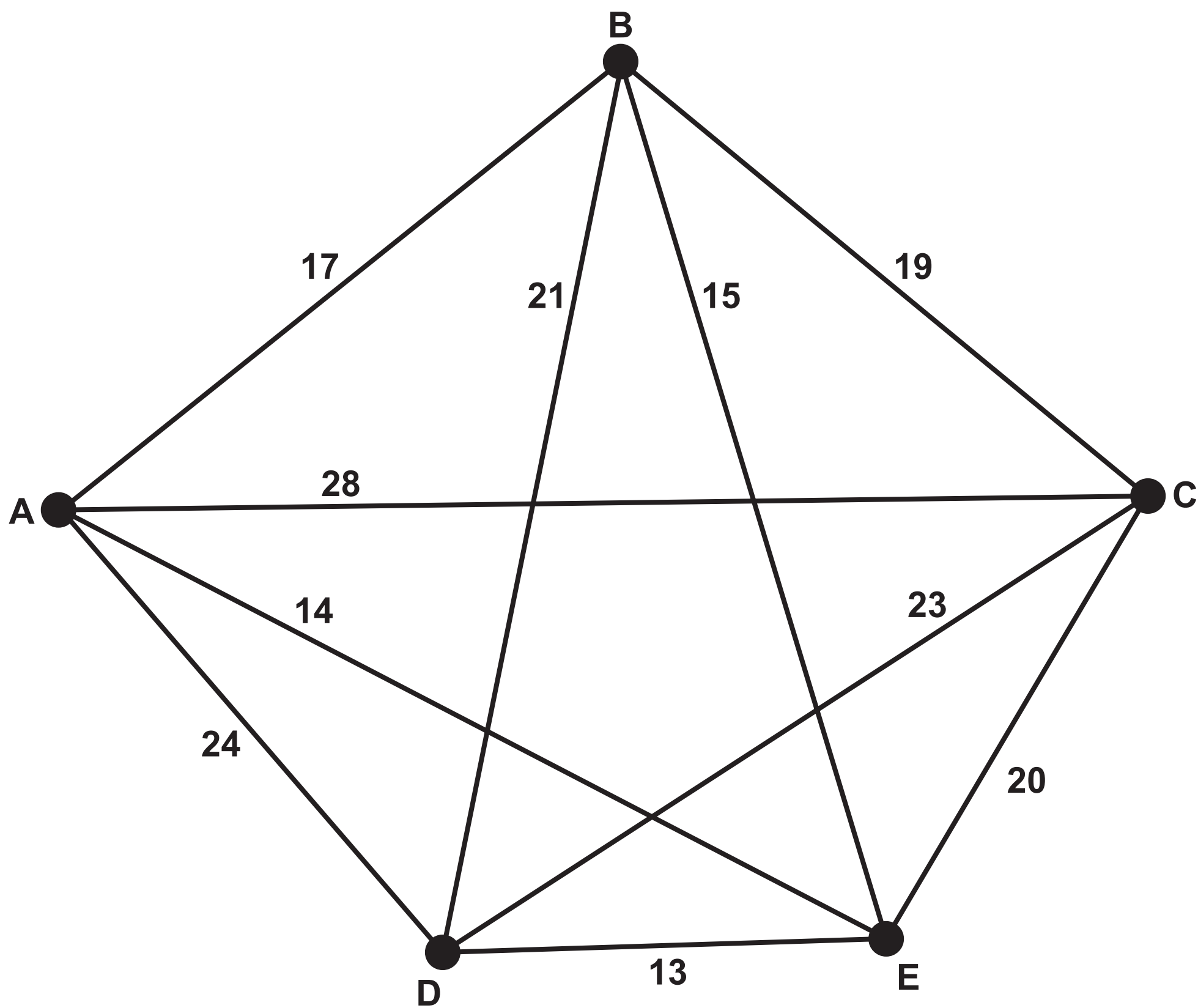


Diagram 15

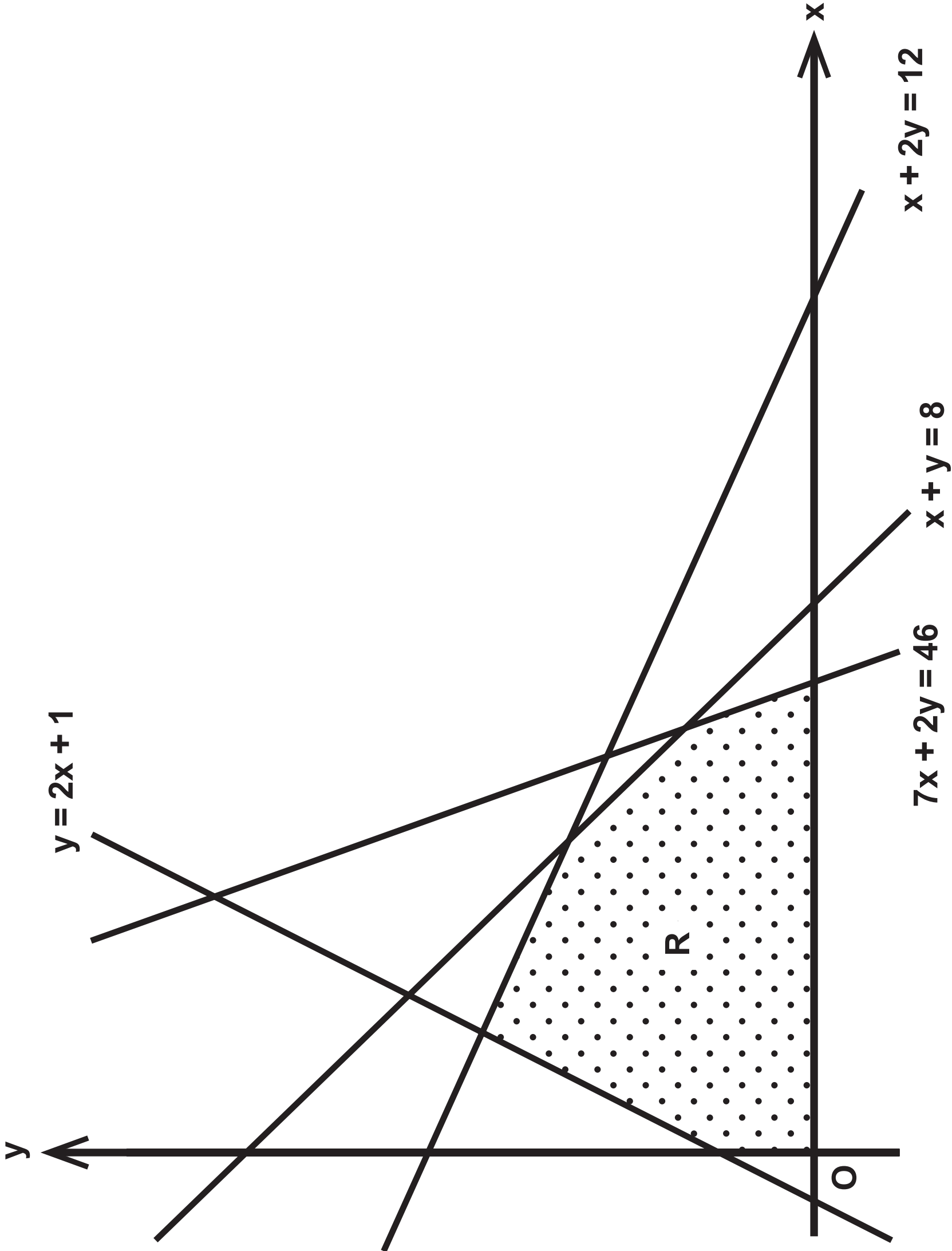


Diagram 15

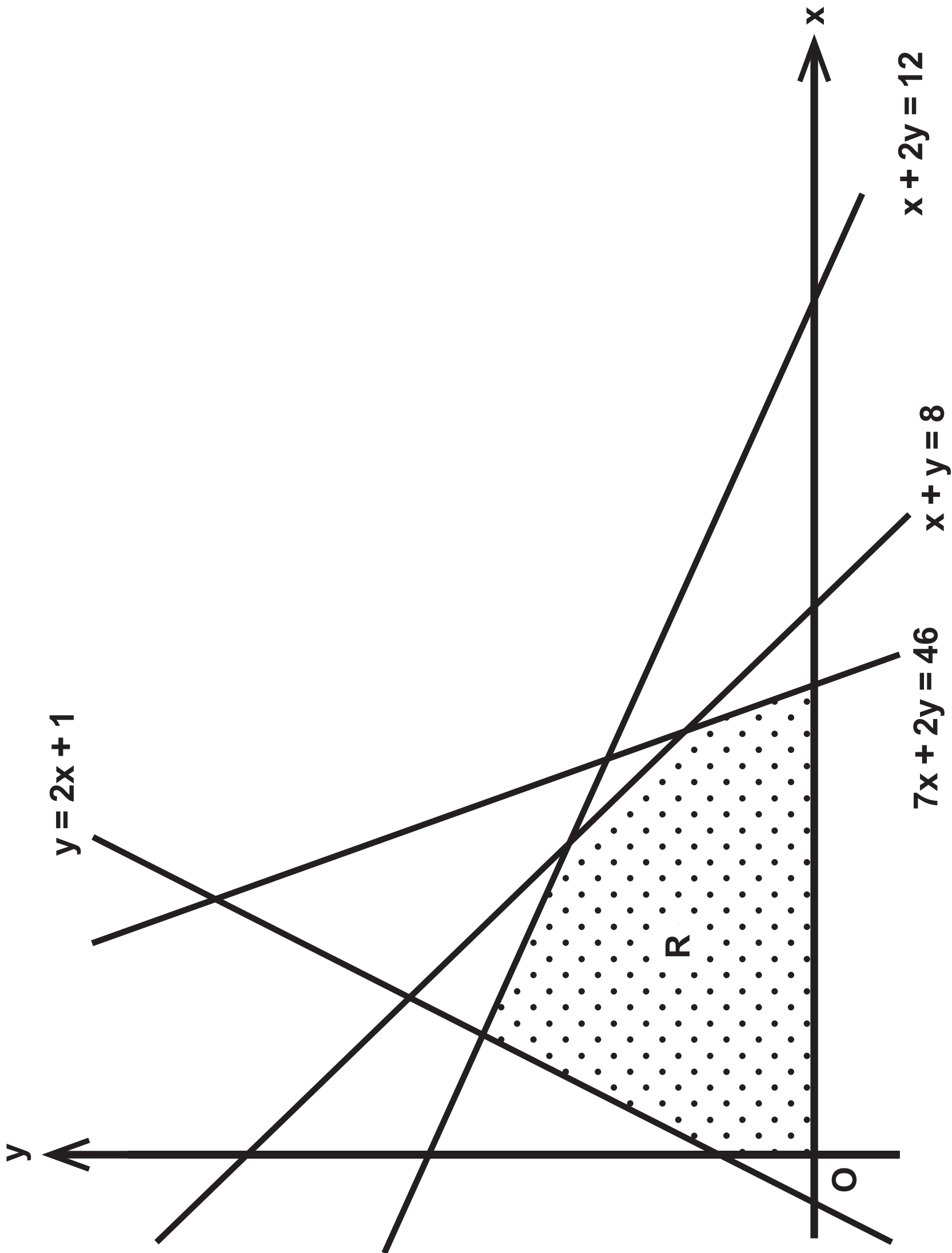


Diagram 16

b.v.	x	y	s ₁	s ₂	s ₃	s ₄	Value
s ₁	0	0	1	$-\frac{3}{5}$	0	$\frac{1}{5}$	1
x	1	0	0	$\frac{1}{5}$	0	$-\frac{2}{5}$	2
s ₃	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 ₁	s ₂	s ₃	s ₄	Value
s ₁	0	0	1	$-\frac{3}{5}$	0	$\frac{1}{5}$	1
x	1	0	0	$\frac{1}{5}$	0	$-\frac{2}{5}$	2
s ₃	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