FernUniversität in Hagen
Fakultät für Mathematik und Informatik

theoretische informatik

Drawing graphs with few segments on the grid

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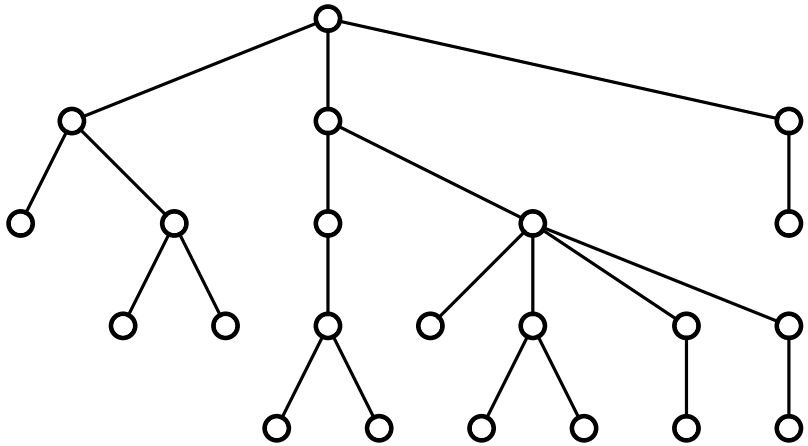
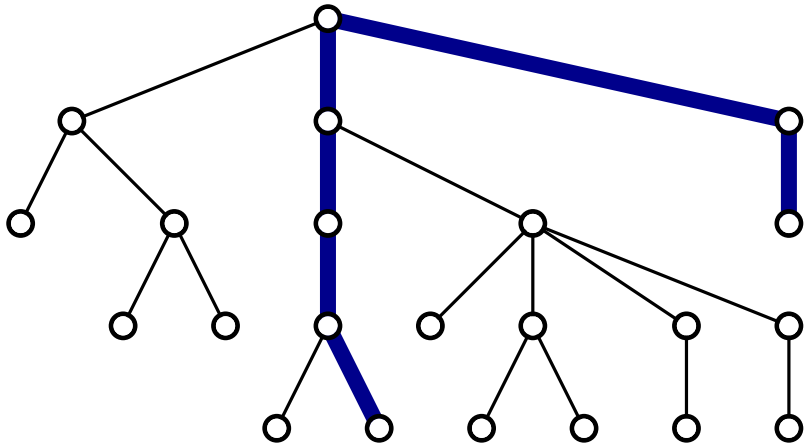
Bertinoro Workshop on Graph Drawing

Few Segments



21 edges

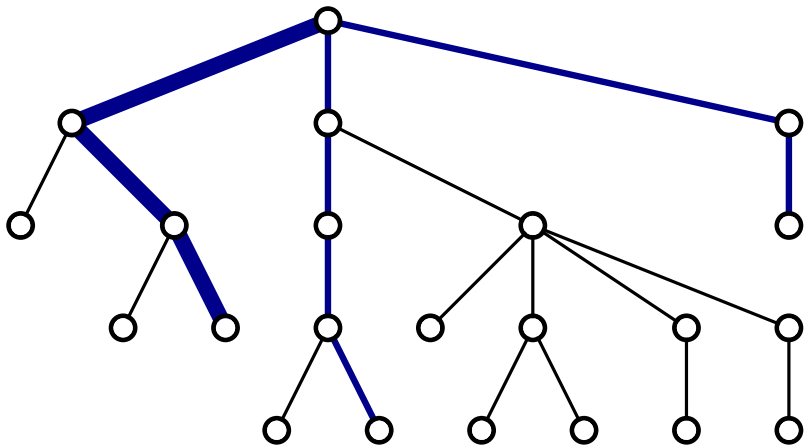
Few Segments



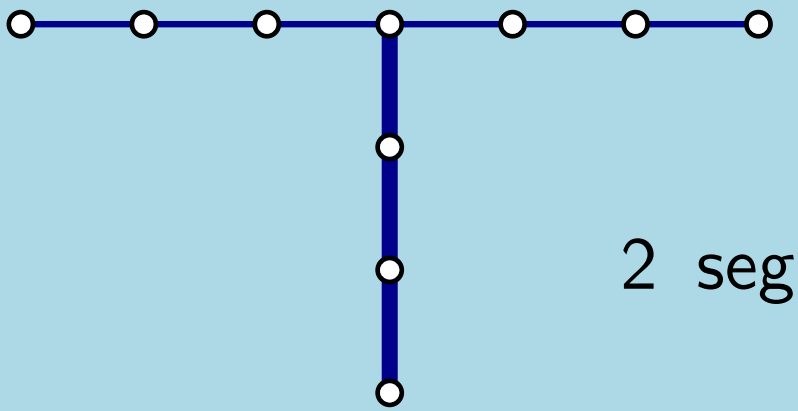
21 edges

1 segment

Few Segments

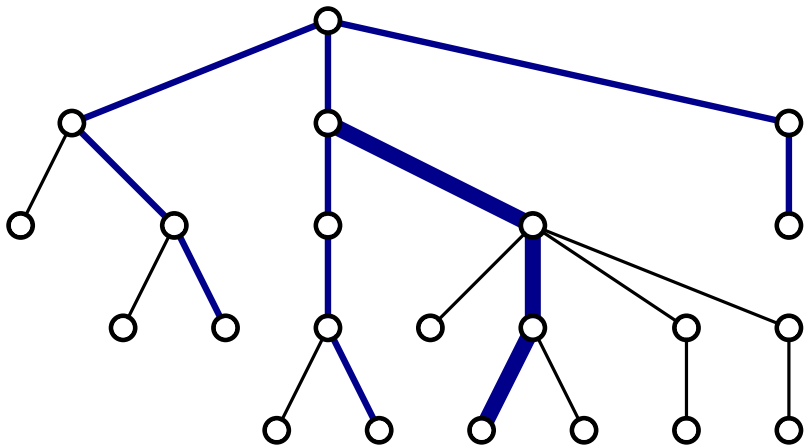


21 edges

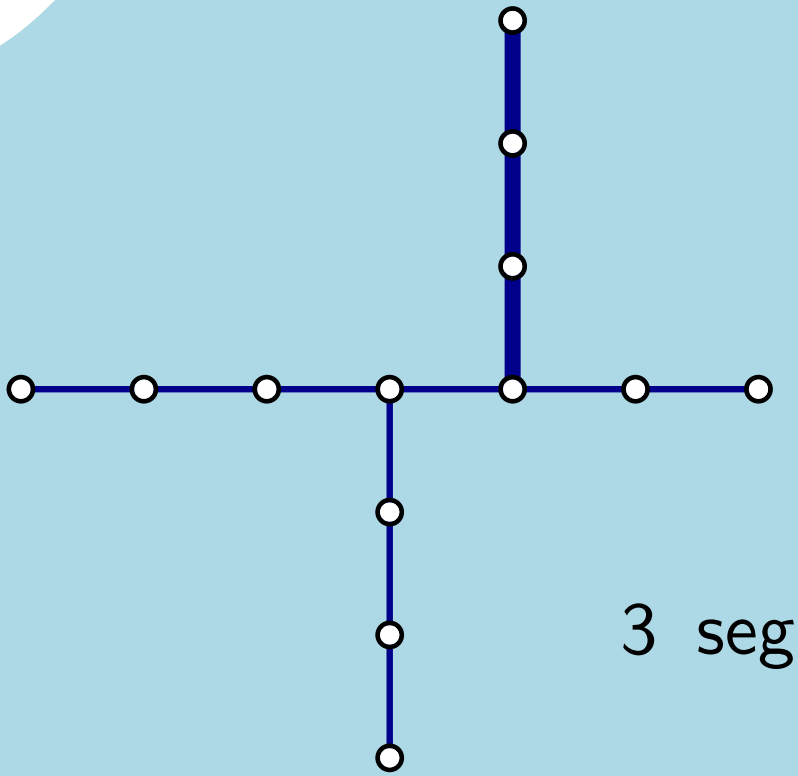


2 segments

Few Segments

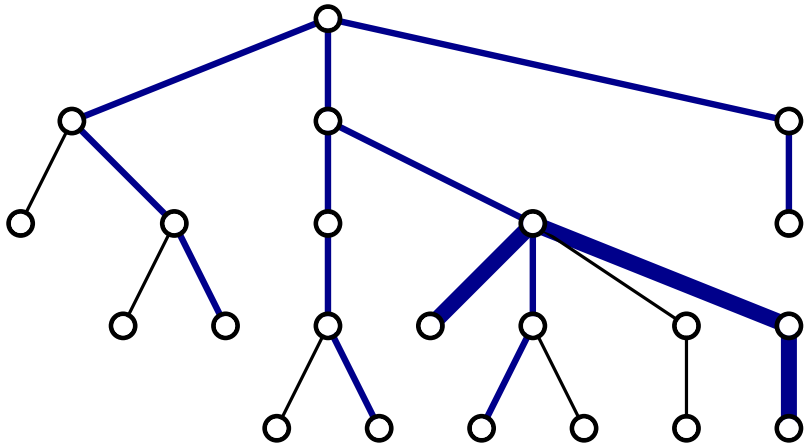


21 edges

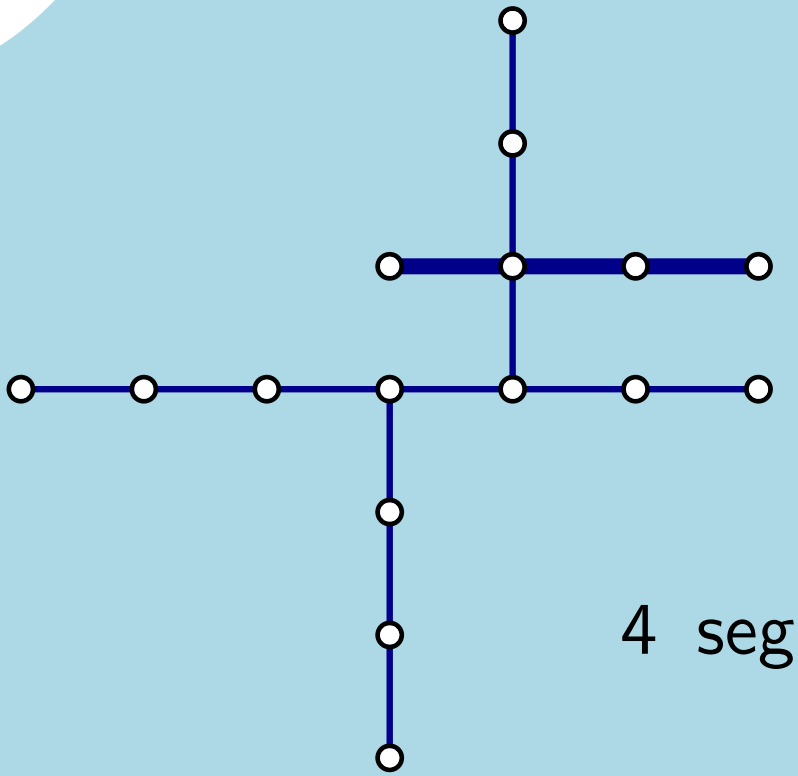


3 segments

Few Segments

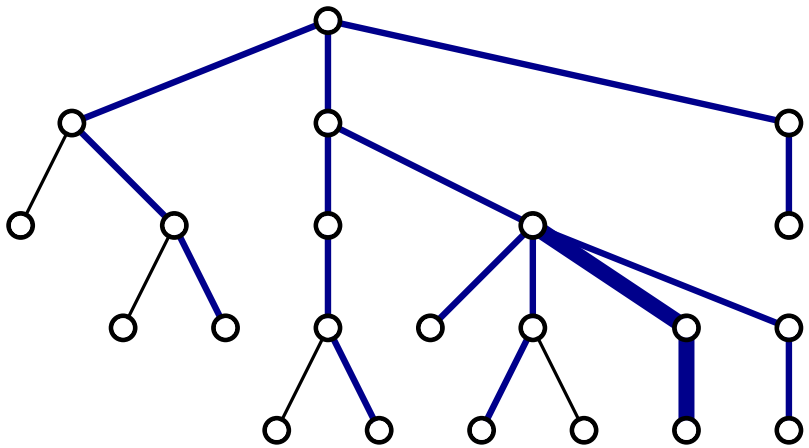


21 edges

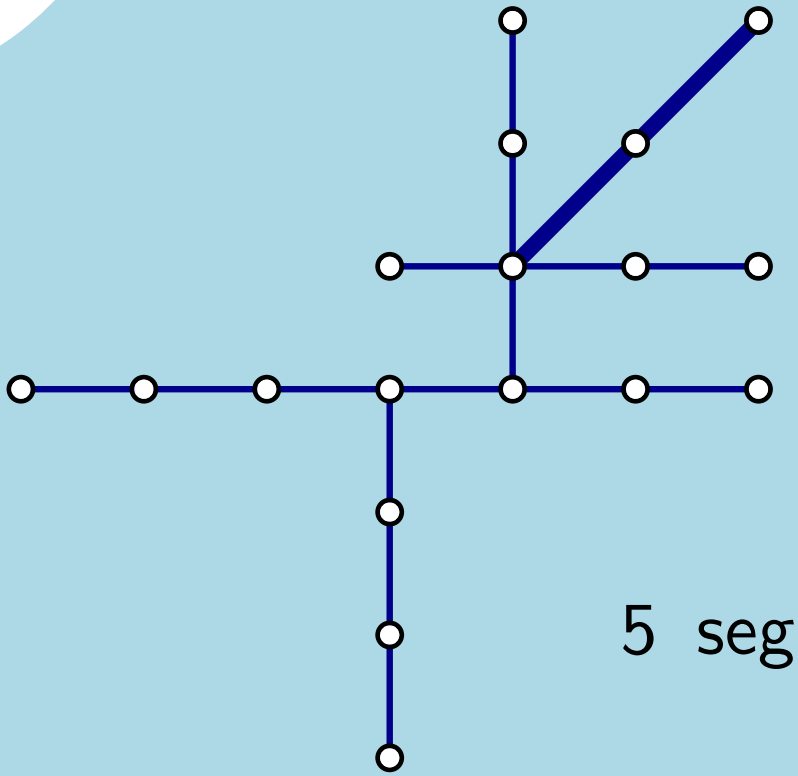


4 segments

Few Segments

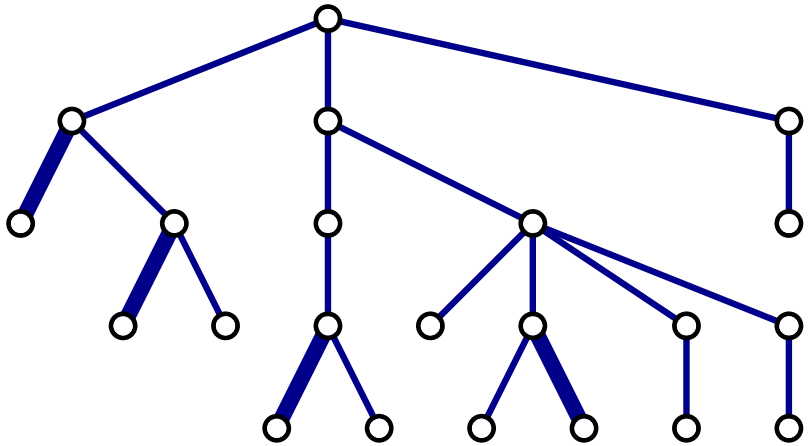


21 edges

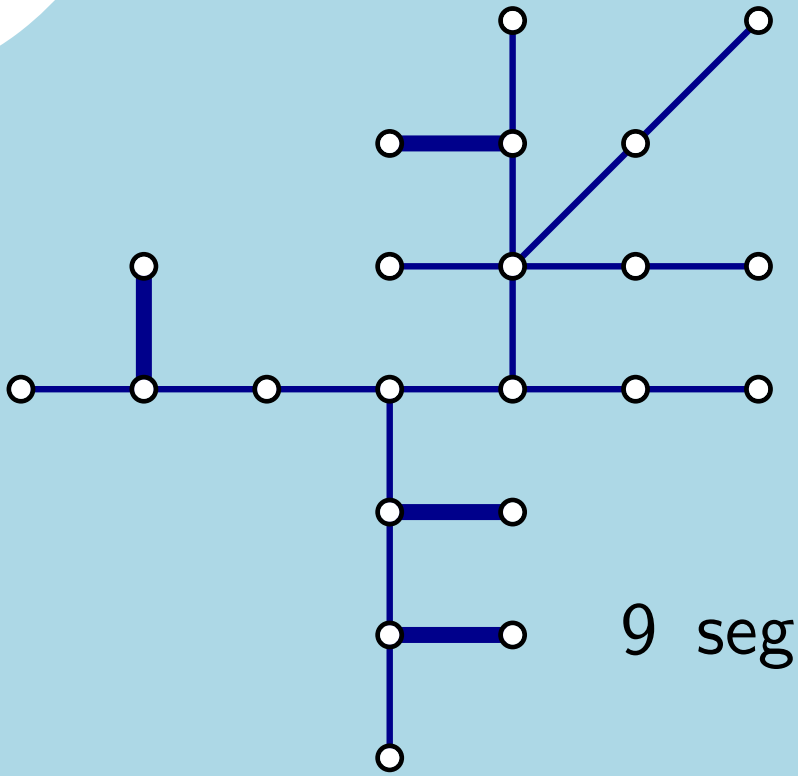


5 segments

Few Segments

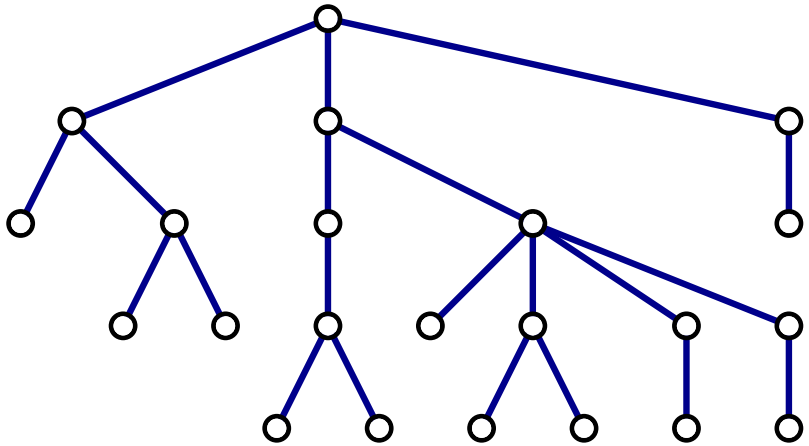


21 edges

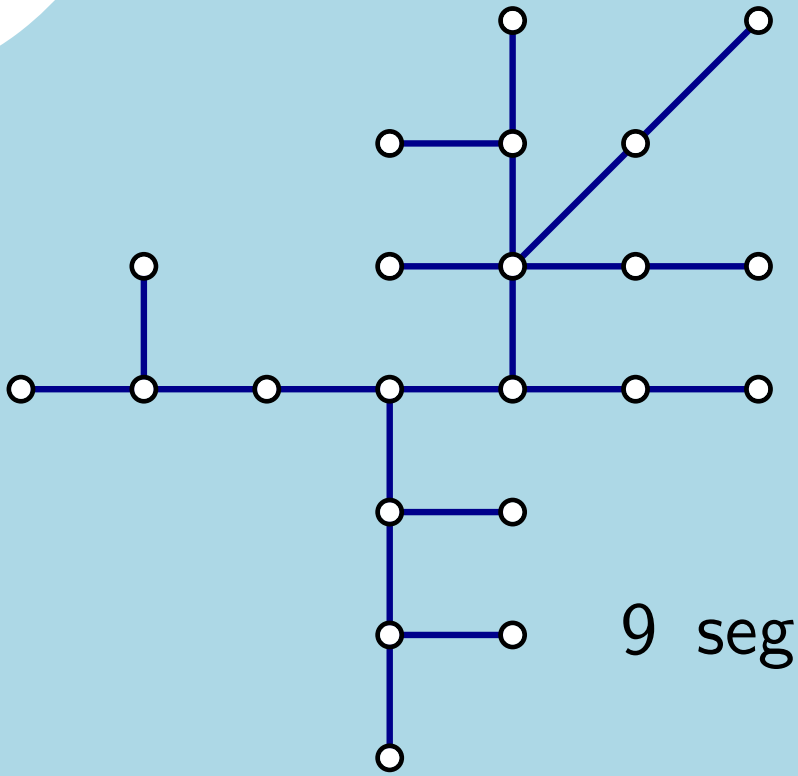


9 segments

Few Segments



21 edges



9 segments

Known Results

Class	Segments	
	Lower	Upper

Known Results

Class	Segments	
	Lower	Upper
Tree	$\vartheta/2$ [1]	$\vartheta/2$ [1]

[1] Dujmović et al. 2007

Known Results

Class	Segments	
	Lower	Upper
Tree	$\vartheta/2$ [1]	$\vartheta/2$ [1]
max. outerplanar	n [1]	n [1]

[1] Dujmović et al. 2007

Known Results

Class	Segments	
	Lower	Upper
Tree	$\vartheta/2$ [1]	$\vartheta/2$ [1]
max. outerplanar	n [1]	n [1]
2-trees	$3n/2$ [1]	$3n/2$ [1]

[1] Dujmović et al. 2007

Known Results

Class	Segments	
	Lower	Upper
Tree	$\vartheta/2$ [1]	$\vartheta/2$ [1]
max. outerplanar	n [1]	n [1]
2-trees	$3n/2$ [1]	$3n/2$ [1]
3-trees	$2n$ [1]	$2n$ [1]

[1] Dujmović et al. 2007

Known Results

Class	Segments	
	Lower	Upper
Tree	$\vartheta/2$ [1]	$\vartheta/2$ [1]
max. outerplanar	n [1]	n [1]
2-trees	$3n/2$ [1]	$3n/2$ [1]
3-trees	$2n$ [1]	$2n$ [1]
2-connected	$2n$ [1]	?

[1] Dujmović et al. 2007

Known Results

Class	Segments	
	Lower	Upper
Tree	$\vartheta/2$ [1]	$\vartheta/2$ [1]
max. outerplanar	n [1]	n [1]
2-trees	$3n/2$ [1]	$3n/2$ [1]
3-trees	$2n$ [1]	$2n$ [1]
2-connected	$2n$ [1]	?
3-connected	$2n$ [1]	$5n/2$ [1]

[1] Dujmović et al. 2007

Known Results

Class	Segments	
	Lower	Upper
Tree	$\vartheta/2$ [1]	$\vartheta/2$ [1]
max. outerplanar	n [1]	n [1]
2-trees	$3n/2$ [1]	$3n/2$ [1]
3-trees	$2n$ [1]	$2n$ [1]
2-connected	$2n$ [1]	?
3-connected	$2n$ [1]	$5n/2$ [1]
cubic 3-conn.	$n/2$ [3]	$n/2$ [2]

[1] Dujmović et al. 2007 [2] Igamberdiev et al. 2015 [3] Mondal et al. 2013

Known Results

Class	Segments	
	Lower	Upper
Tree	$\vartheta/2$ [1]	$\vartheta/2$ [1]
max. outerplanar	n [1]	n [1]
2-trees	$3n/2$ [1]	$3n/2$ [1]
3-trees	$2n$ [1]	$2n$ [1]
2-connected	$2n$ [1]	?
3-connected	$2n$ [1]	$5n/2$ [1]
cubic 3-conn.	$n/2$ [3]	$n/2$ [2]
Triangulation	$2n$ [4]	$7n/3$ [4]

[1] Dujmović et al. 2007 [2] Igamberdiev et al. 2015 [3] Mondal et al. 2013
[4] Durocher & Mondal 2014

Known Results

Class	Segments	
	Lower	Upper
Tree	$\vartheta/2$ [1]	$\vartheta/2$ [1]
max. outerplanar	n [1]	n [1]
2-trees	$3n/2$ [1]	$3n/2$ [1]
3-trees	$2n$ [1]	$2n$ [1]
2-connected	$2n$ [1]	?
3-connected	$2n$ [1]	$5n/2$ [1]
cubic 3-conn.	$n/2$ [3]	$n/2$ [2]
Triangulation	$2n$ [4]	$7n/3$ [4]
Planar	$2n$ [4]	$16n/3 - e$ [4]

[1] Dujmović et al. 2007 [2] Igamberdiev et al. 2015 [3] Mondal et al. 2013
[4] Durocher & Mondal 2014

Known Results

Class	Segments		Grid Segments	
	Lower	Upper	Segm.	Area
Tree	$\vartheta/2$ [1]	$\vartheta/2$ [1]		
max. outerplanar	n [1]	n [1]		
2-trees	$3n/2$ [1]	$3n/2$ [1]		
3-trees	$2n$ [1]	$2n$ [1]		
2-connected	$2n$ [1]	?		
3-connected	$2n$ [1]	$5n/2$ [1]		
cubic 3-conn.	$n/2$ [3]	$n/2$ [2]		
Triangulation	$2n$ [4]	$7n/3$ [4]		
Planar	$2n$ [4]	$16n/3 - e$ [4]		

[1] Dujmović et al. 2007 [2] Igamberdiev et al. 2015 [3] Mondal et al. 2013
[4] Durocher & Mondal 2014

Known Results

Class	Segments		Grid Segments	
	Lower	Upper	Segm.	Area
Tree	$\vartheta/2$ [1]	$\vartheta/2$ [1]		
max. outerplanar	n [1]	n [1]		
2-trees	$3n/2$ [1]	$3n/2$ [1]		
3-trees	$2n$ [1]	$2n$ [1]		
2-connected	$2n$ [1]	?		
3-connected	$2n$ [1]	$5n/2$ [1]		
cubic 3-conn.	$n/2$ [3]	$n/2$ [2]	$n/2$ [2]	$O(n) \times O(n)$
Triangulation	$2n$ [4]	$7n/3$ [4]		
Planar	$2n$ [4]	$16n/3 - e$ [4]		

[1] Dujmović et al. 2007 [2] Igamberdiev et al. 2015 [3] Mondal et al. 2013
[4] Durocher & Mondal 2014

Known Results

Class	Segments		Grid Segments	
	Lower	Upper	Segm.	Area
Tree	$\vartheta/2$ [1]	$\vartheta/2$ [1]	$3n/4$ [5]	$O(n^2) \times O(n^{1.58})$
max. outerplanar	n [1]	n [1]		
2-trees	$3n/2$ [1]	$3n/2$ [1]		
3-trees	$2n$ [1]	$2n$ [1]		
2-connected	$2n$ [1]	?		
3-connected	$2n$ [1]	$5n/2$ [1]		
cubic 3-conn.	$n/2$ [3]	$n/2$ [2]	$n/2$ [2]	$O(n) \times O(n)$
Triangulation	$2n$ [4]	$7n/3$ [4]		
Planar	$2n$ [4]	$16n/3 - e$ [4]		

[1] Dujmović et al. 2007 [2] Igamberdiev et al. 2015 [3] Mondal et al. 2013
[4] Durocher & Mondal 2014 [5] Hültenschmidt et al. 2017

Known Results

Class	Segments		Grid Segments	
	Lower	Upper	Segm.	Area
Tree	$\vartheta/2$ [1]	$\vartheta/2$ [1]	$3n/4$ [5] $\vartheta/2$ [5]	$O(n^2) \times O(n^{1.58})$ quasipolynomial
max. outerplanar	n [1]	n [1]		
2-trees	$3n/2$ [1]	$3n/2$ [1]		
3-trees	$2n$ [1]	$2n$ [1]		
2-connected	$2n$ [1]	?		
3-connected	$2n$ [1]	$5n/2$ [1]		
cubic 3-conn.	$n/2$ [3]	$n/2$ [2]	$n/2$ [2]	$O(n) \times O(n)$
Triangulation	$2n$ [4]	$7n/3$ [4]		
Planar	$2n$ [4]	$16n/3 - e$ [4]		

[1] Dujmović et al. 2007 [2] Igamberdiev et al. 2015 [3] Mondal et al. 2013

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Known Results

Class	Segments		Grid Segments	
	Lower	Upper	Segm.	Area
Tree	$\vartheta/2$ [1]	$\vartheta/2$ [1]	$3n/4$ [5] $\vartheta/2$ [5]	$O(n^2) \times O(n^{1.58})$ quasipolynomial
max. outerplanar	n [1]	n [1]	$3n/2$ [5]	$O(n) \times O(n^2)$
2-trees	$3n/2$ [1]	$3n/2$ [1]		
3-trees	$2n$ [1]	$2n$ [1]		
2-connected	$2n$ [1]	?		
3-connected	$2n$ [1]	$5n/2$ [1]		
cubic 3-conn.	$n/2$ [3]	$n/2$ [2]	$n/2$ [2]	$O(n) \times O(n)$
Triangulation	$2n$ [4]	$7n/3$ [4]		
Planar	$2n$ [4]	$16n/3 - e$ [4]		

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Known Results

Class	Segments		Grid Segments	
	Lower	Upper	Segm.	Area
Tree	$\vartheta/2$ [1]	$\vartheta/2$ [1]	$3n/4$ [5] $\vartheta/2$ [5]	$O(n^2) \times O(n^{1.58})$ quasipolynomial
max. outerplanar	n [1]	n [1]	$3n/2$ [5]	$O(n) \times O(n^2)$
2-trees	$3n/2$ [1]	$3n/2$ [1]		
3-trees	$2n$ [1]	$2n$ [1]	$8n/3$ [5]	$O(n) \times O(n^2)$
2-connected	$2n$ [1]	?		
3-connected	$2n$ [1]	$5n/2$ [1]		
cubic 3-conn.	$n/2$ [3]	$n/2$ [2]	$n/2$ [2]	$O(n) \times O(n)$
Triangulation	$2n$ [4]	$7n/3$ [4]		
Planar	$2n$ [4]	$16n/3 - e$ [4]		

[1] Dujmović et al. 2007 [2] Igamberdiev et al. 2015 [3] Mondal et al. 2013

[4] Durocher & Mondal 2014 [5] Hültenschmidt et al. 2017

Known Results

Class	Segments		Grid Segments	
	Lower	Upper	Segm.	Area
Tree	$\vartheta/2$ [1]	$\vartheta/2$ [1]	$3n/4$ [5] $\vartheta/2$ [5]	$O(n^2) \times O(n^{1.58})$ quasipolynomial
max. outerplanar	n [1]	n [1]	$3n/2$ [5]	$O(n) \times O(n^2)$
2-trees	$3n/2$ [1]	$3n/2$ [1]		?
3-trees	$2n$ [1]	$2n$ [1]	$8n/3$ [5]	$O(n) \times O(n^2)$
2-connected	$2n$ [1]	?		?
3-connected	$2n$ [1]	$5n/2$ [1]		
cubic 3-conn.	$n/2$ [3]	$n/2$ [2]	$n/2$ [2]	$O(n) \times O(n)$
Triangulation	$2n$ [4]	$7n/3$ [4]		?
Planar	$2n$ [4]	$16n/3 - e$ [4]		

[1] Dujmović et al. 2007 [2] Igamberdiev et al. 2015 [3] Mondal et al. 2013

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Known Results

Class	Segments		Grid Segments	
	Lower	Upper	Segm.	Area
Tree	$\vartheta/2$ [1]	$\vartheta/2$ [1]	$3n/4$ [5] $\vartheta/2$ [5]	$O(n^2) \times O(n^{1.58})$ quasipolynomial
max. outerplanar	n [1]	n [1]	$3n/2$ [5]	$O(n) \times O(n^2)$
2-trees	$3n/2$ [1]	$3n/2$ [1]		?
3-trees	$2n$ [1]	$2n$ [1]	$8n/3$ [5]	$O(n) \times O(n^2)$
2-connected	$2n$ [1]	?		?
3-connected	$2n$ [1]	$5n/2$ [1]		
cubic 3-conn.	$n/2$ [3]	$n/2$ [2]	$n/2$ [2]	$O(n) \times O(n)$
Triangulation	$2n$ [4]	$7n/3$ [4]		?
Planar	$2n$ [4]	$16n/3 - e$ [4]		
Series-parallel, ...				

[1] Dujmović et al. 2007 [2] Igamberdiev et al. 2015 [3] Mondal et al. 2013

[4] Durocher & Mondal 2014 [5] Hültenschmidt et al. 2017