Using Dynamic Software for All the Right Reasons

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Files and Handouts can be found here:

https://drive.google.com/folderview?id=0Bx3fcSOtoYwGUmFQT21DMG1jdE0&usp=sharing

chuckfriesen@gmail.com

GeoGebraTube

Volume

http://tube.geogebra.org/student/m243895

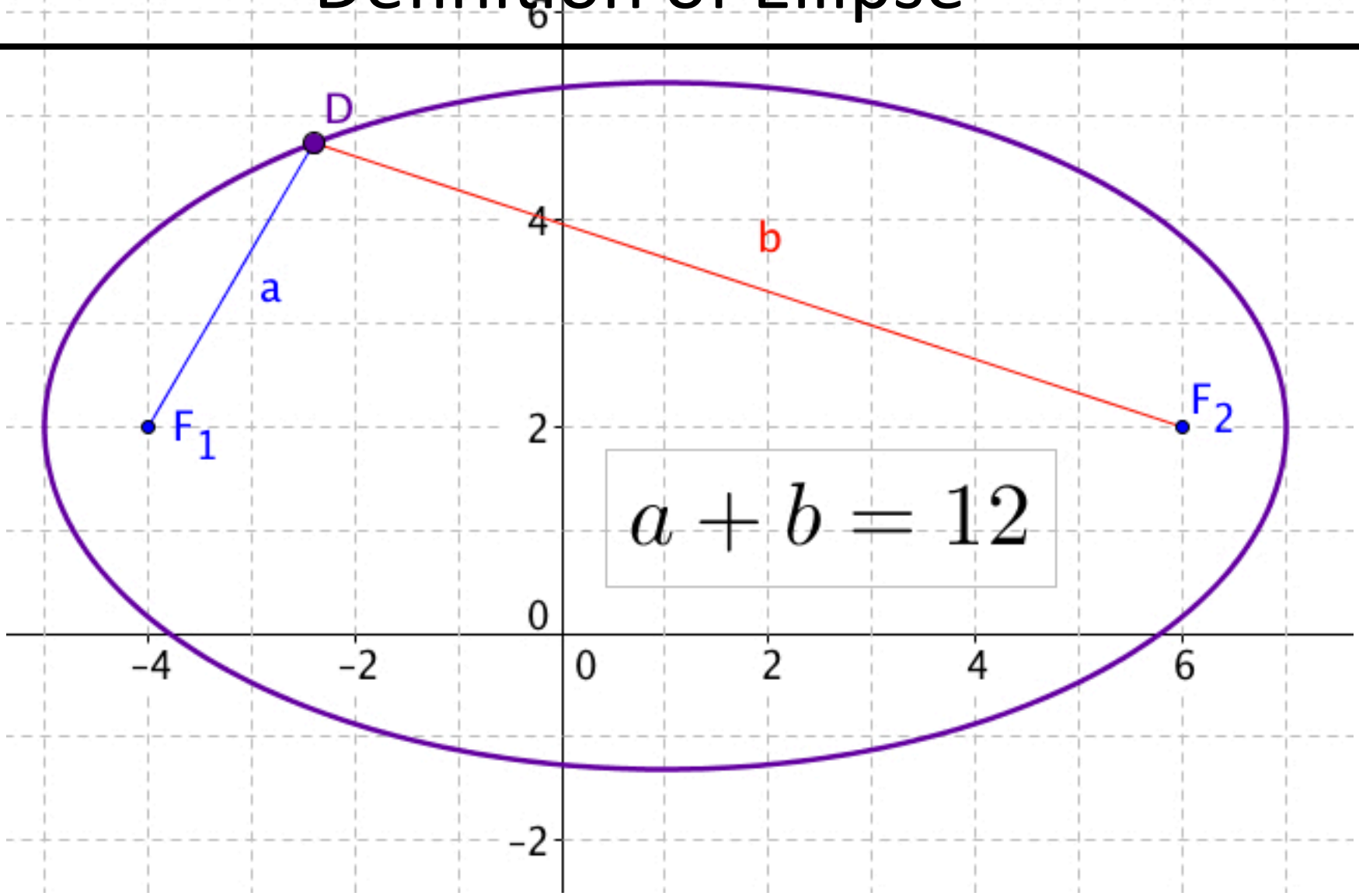
Pappus' Theorem

http://tube.geogebra.org/material/simple/id/137281#material/137284

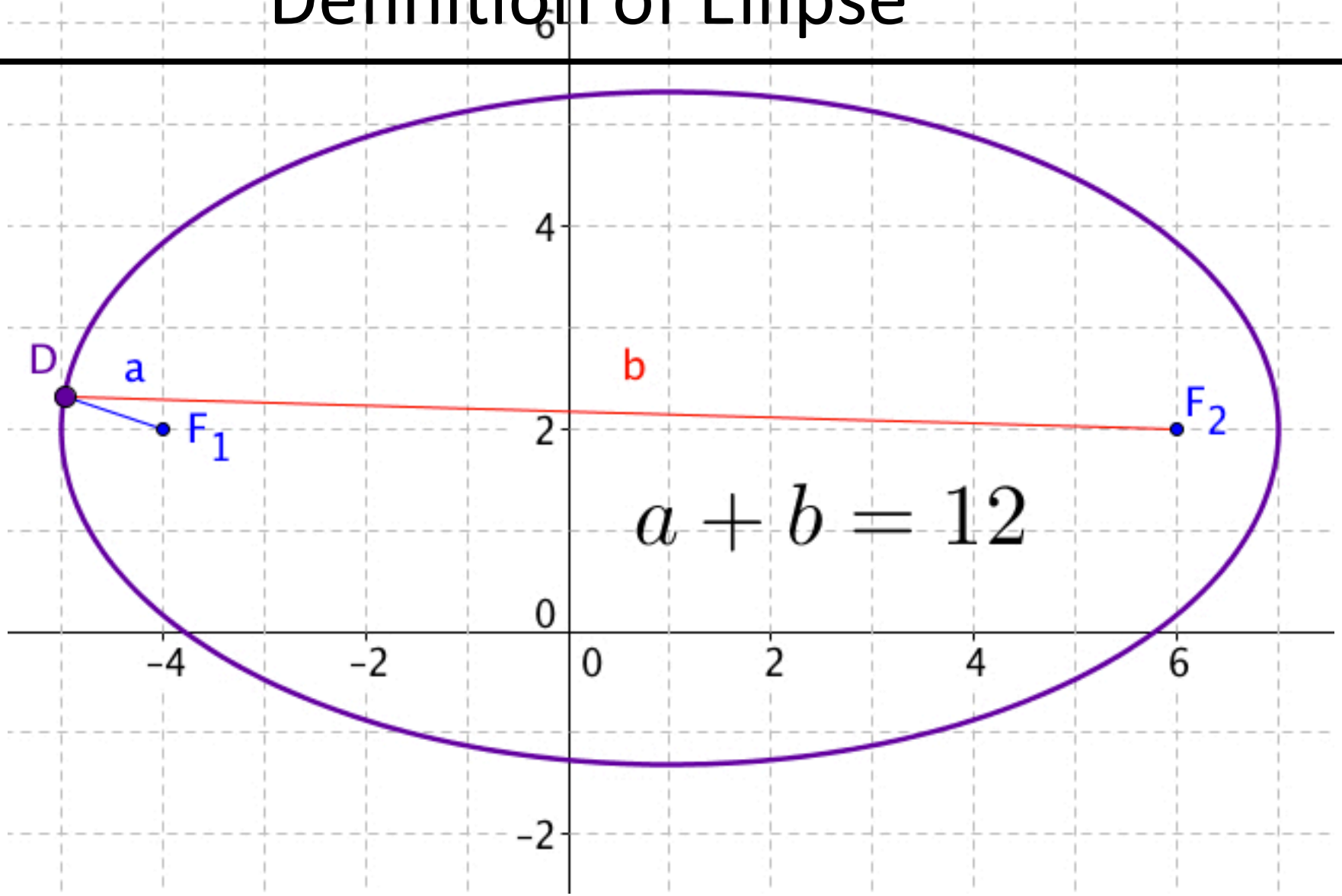
Plotting Points

http://tube.geogebra.org/material/simple/id/1200895#material/1200957

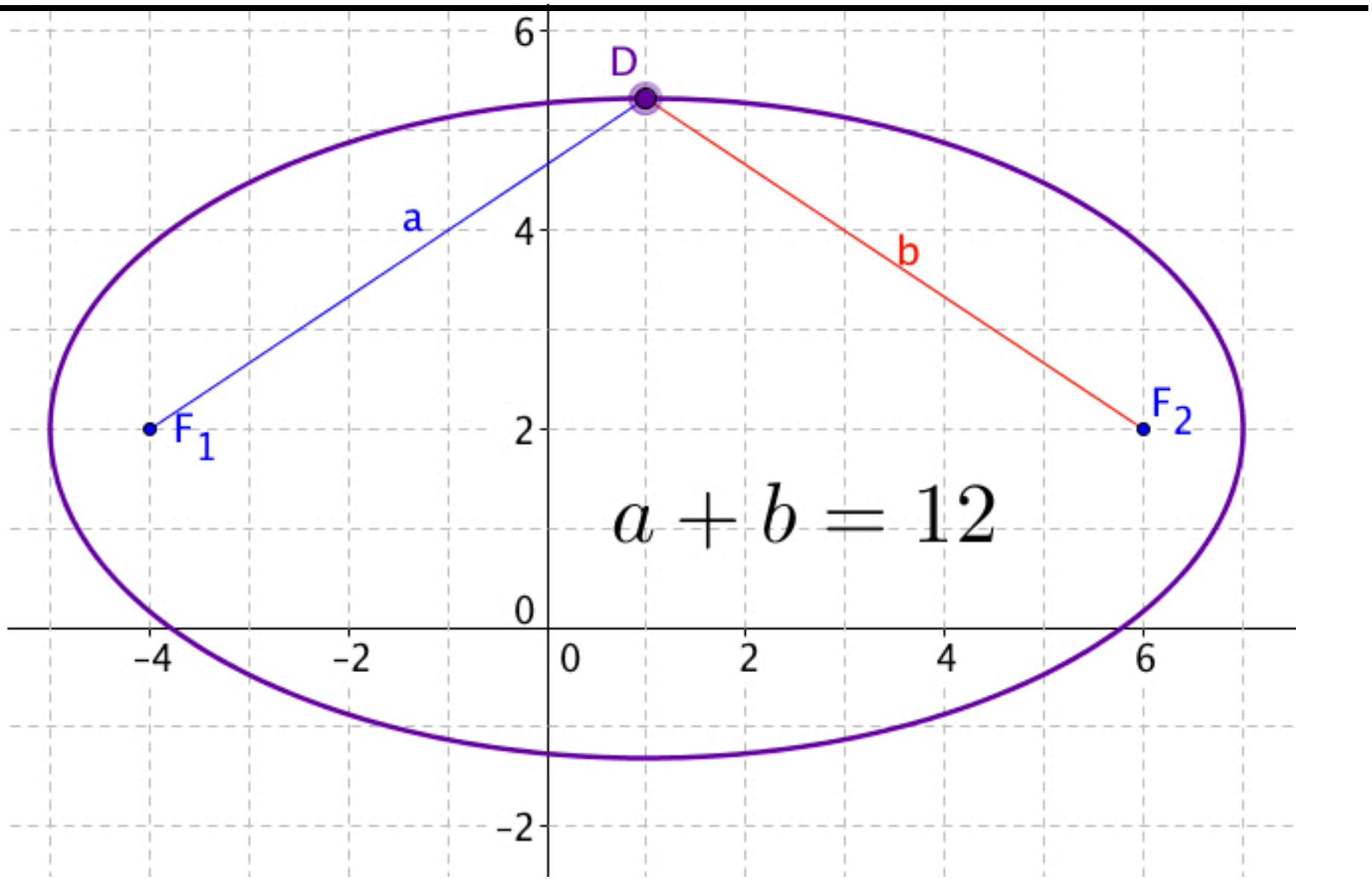
Definition of Ellipse



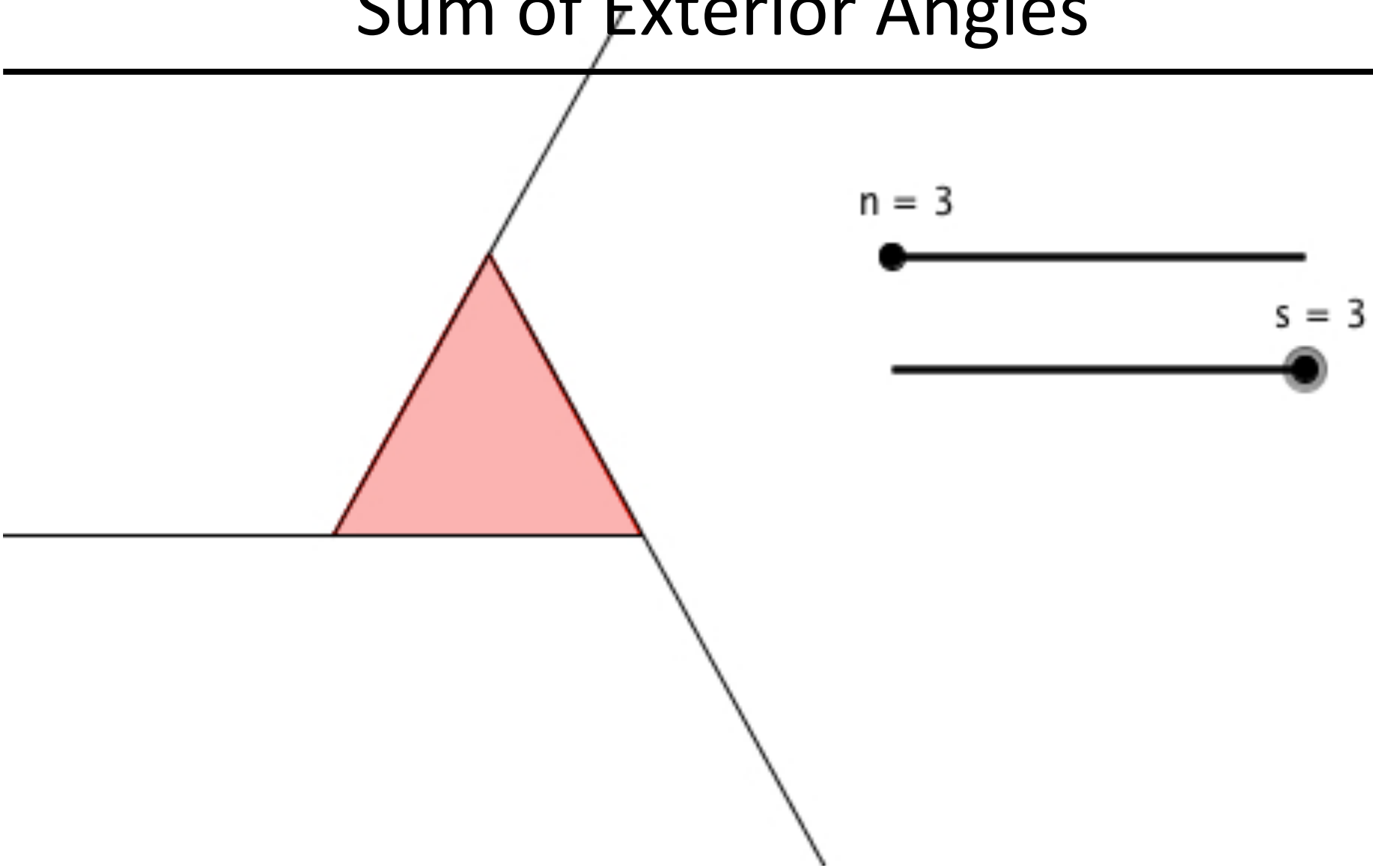
Definition of Ellipse



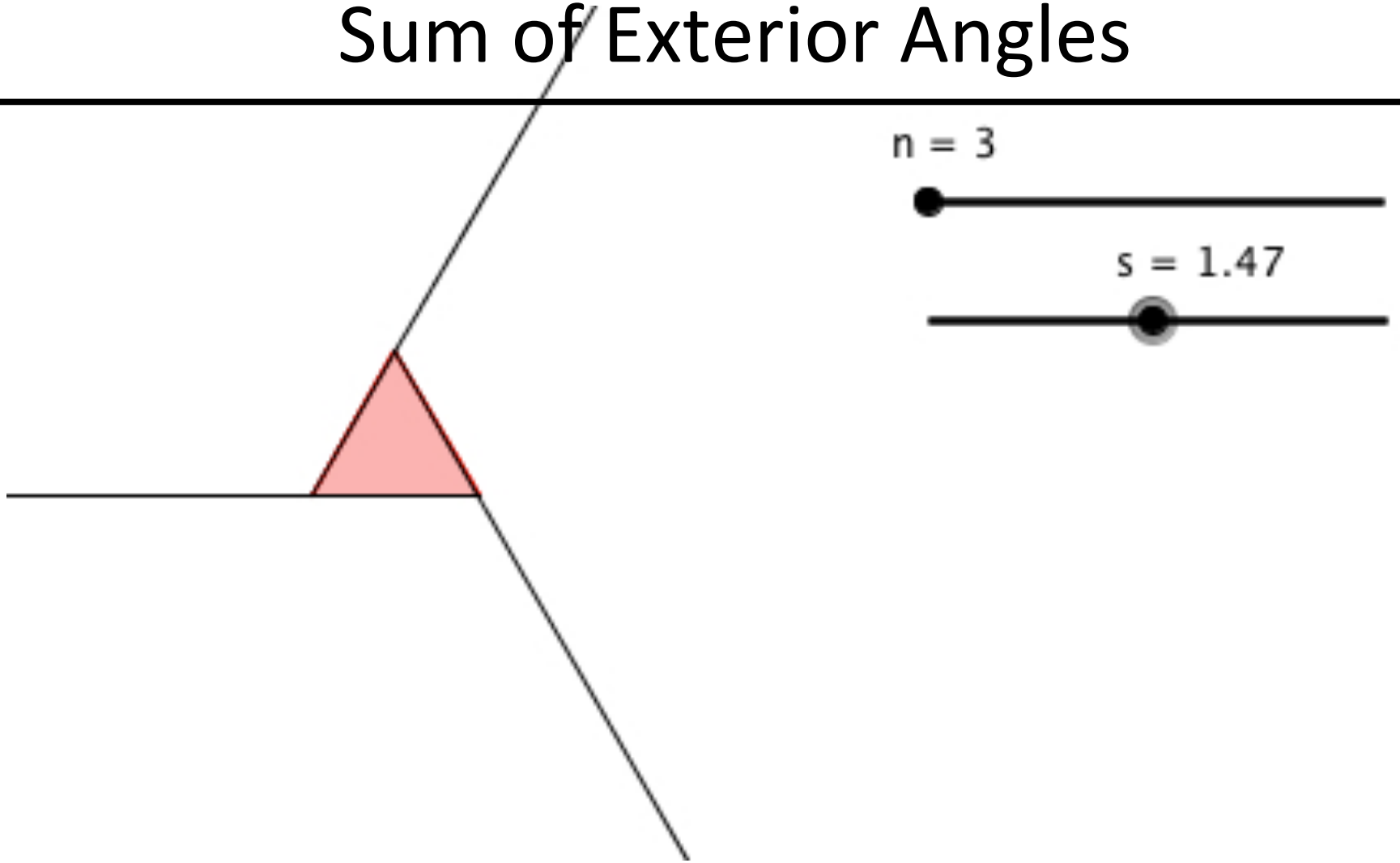
Definition of Ellipse



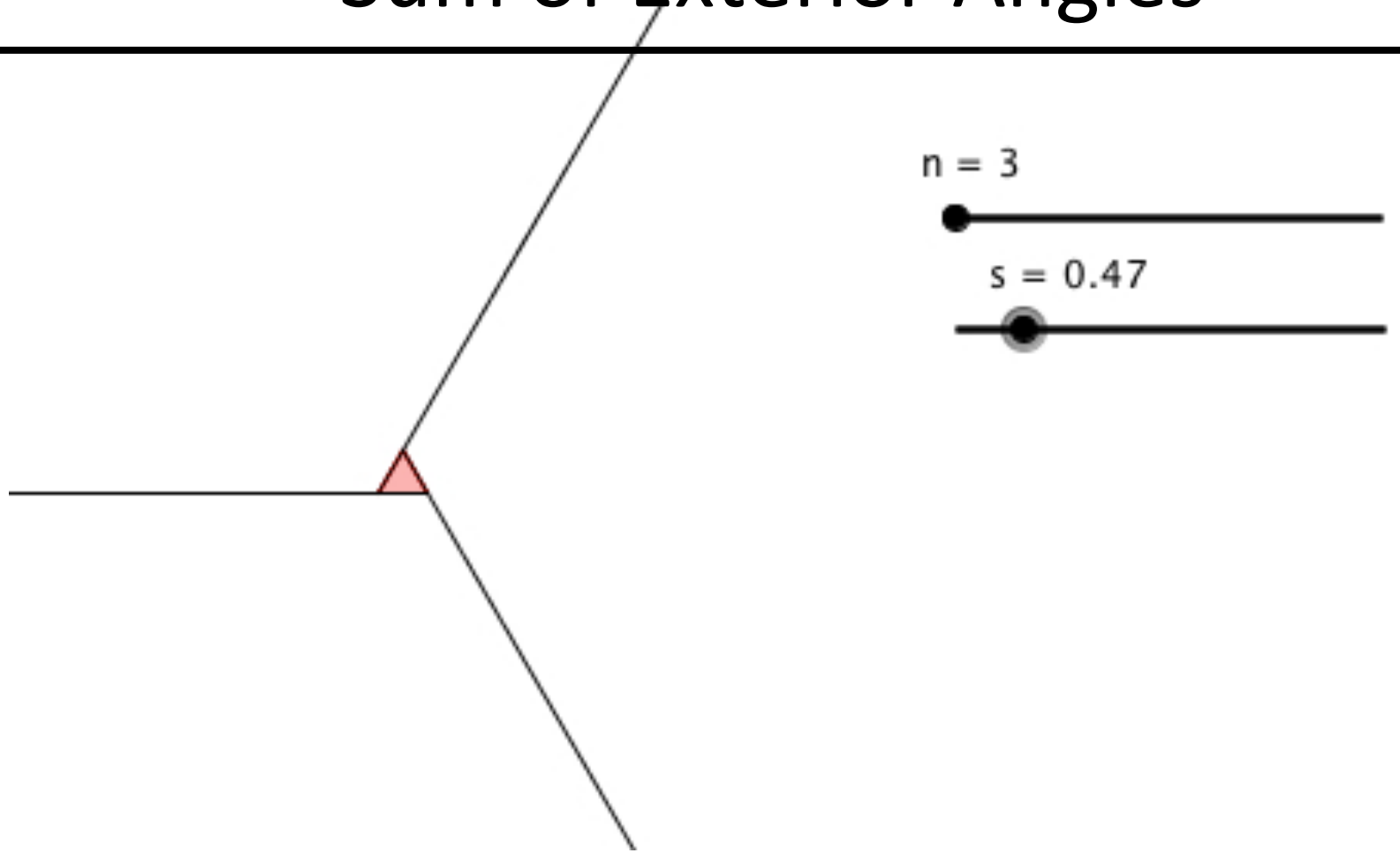
Sum of Exterior Angles



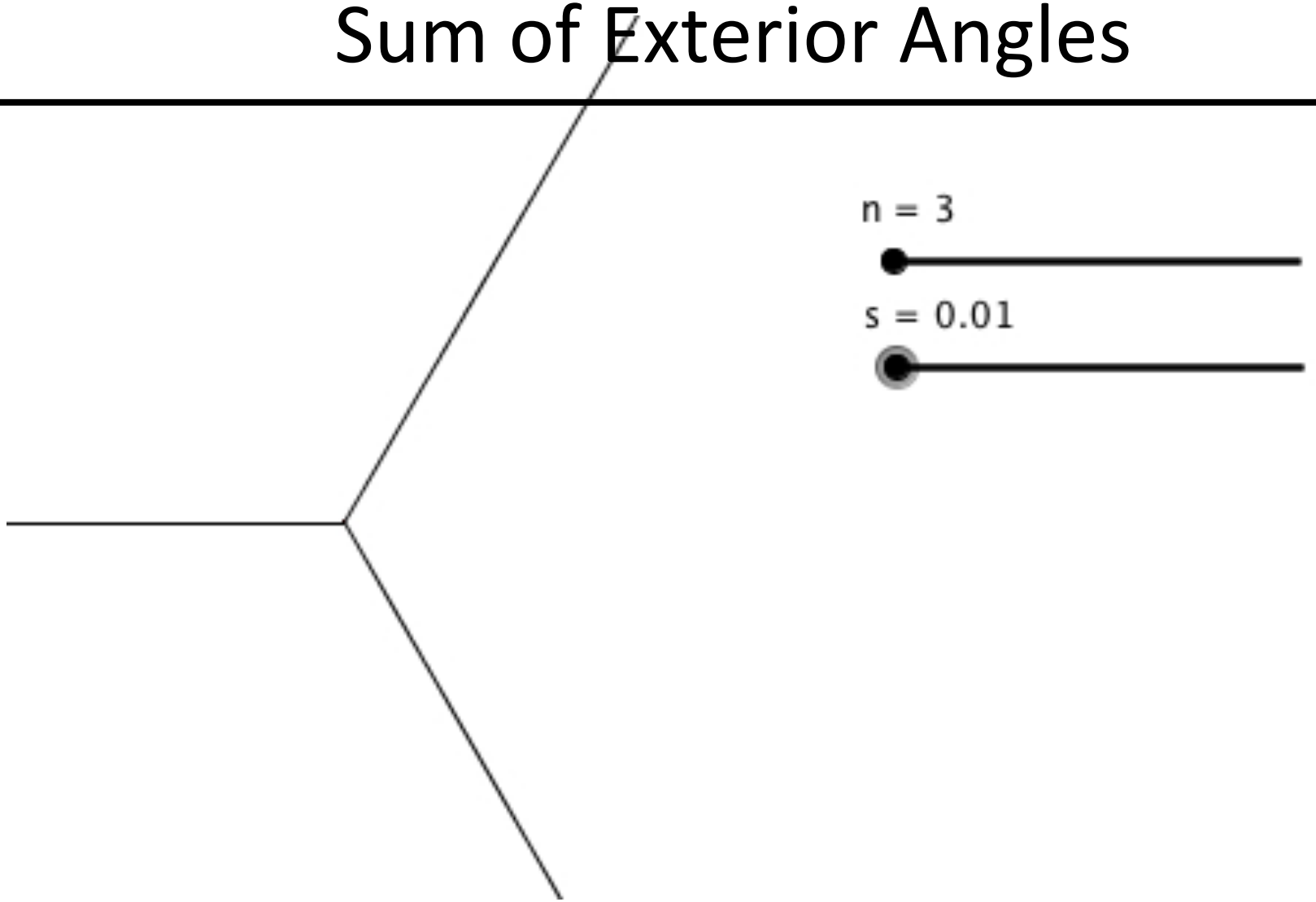
Sum of Exterior Angles



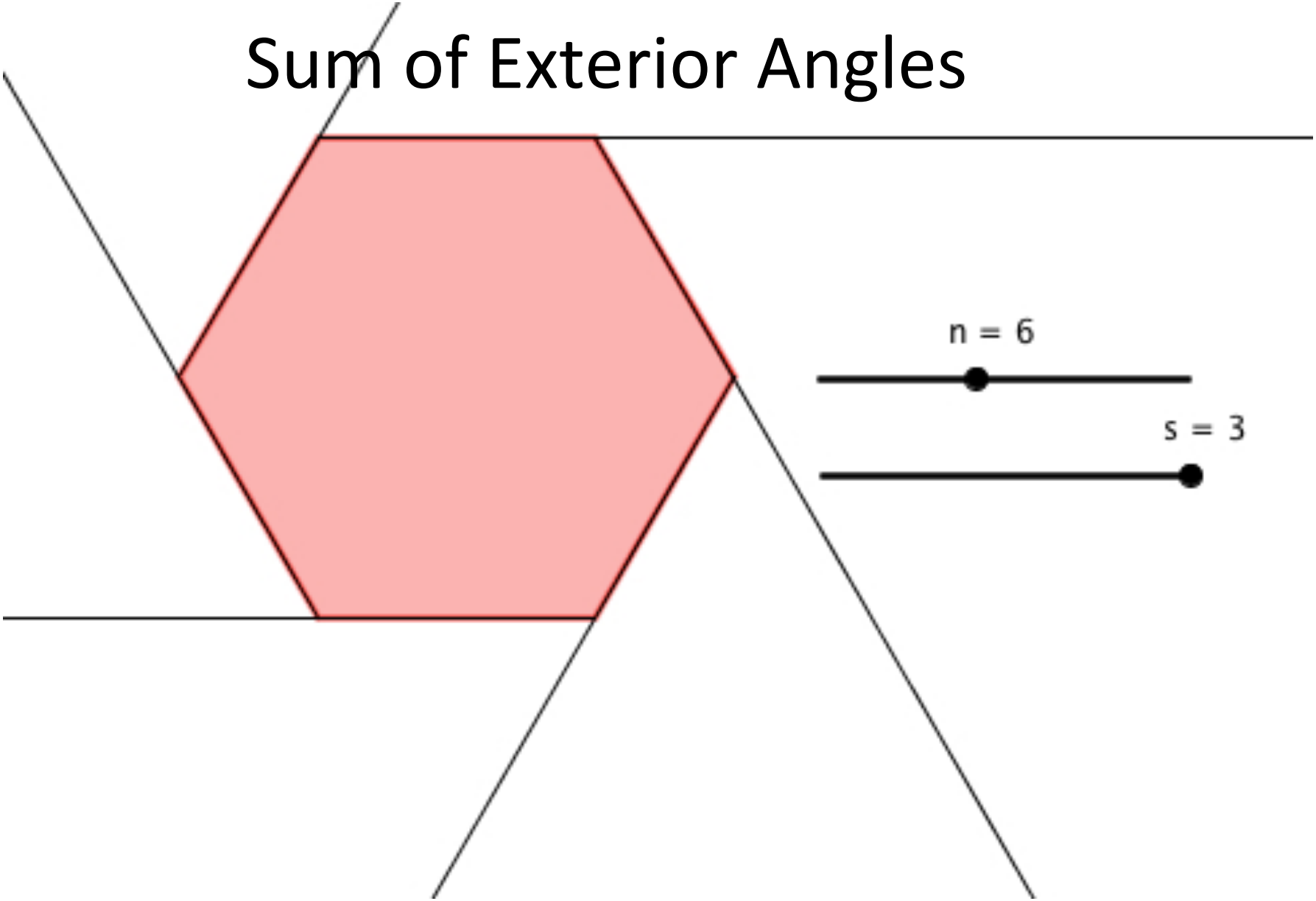
Sum of Exterior Angles



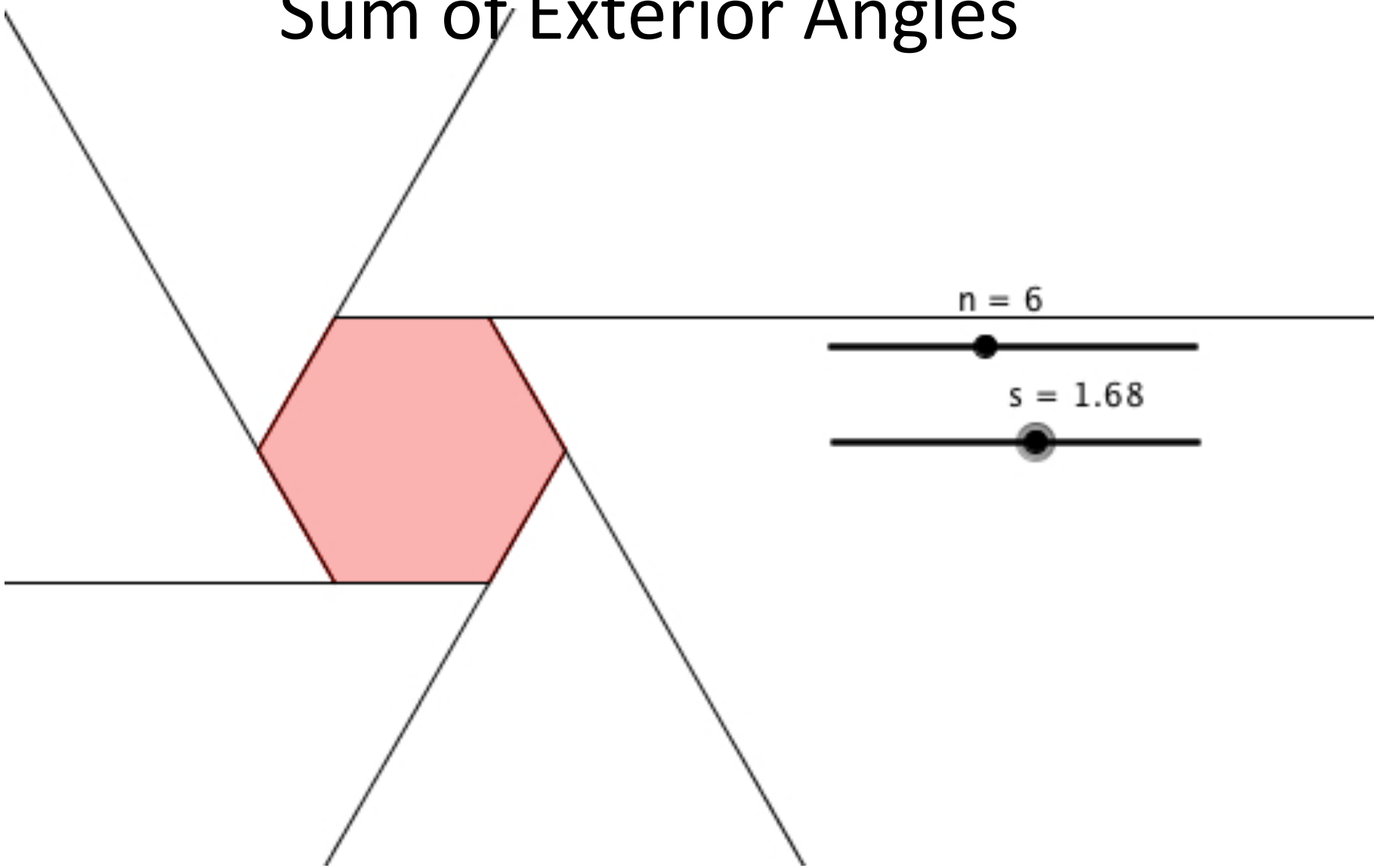
Sum of Exterior Angles



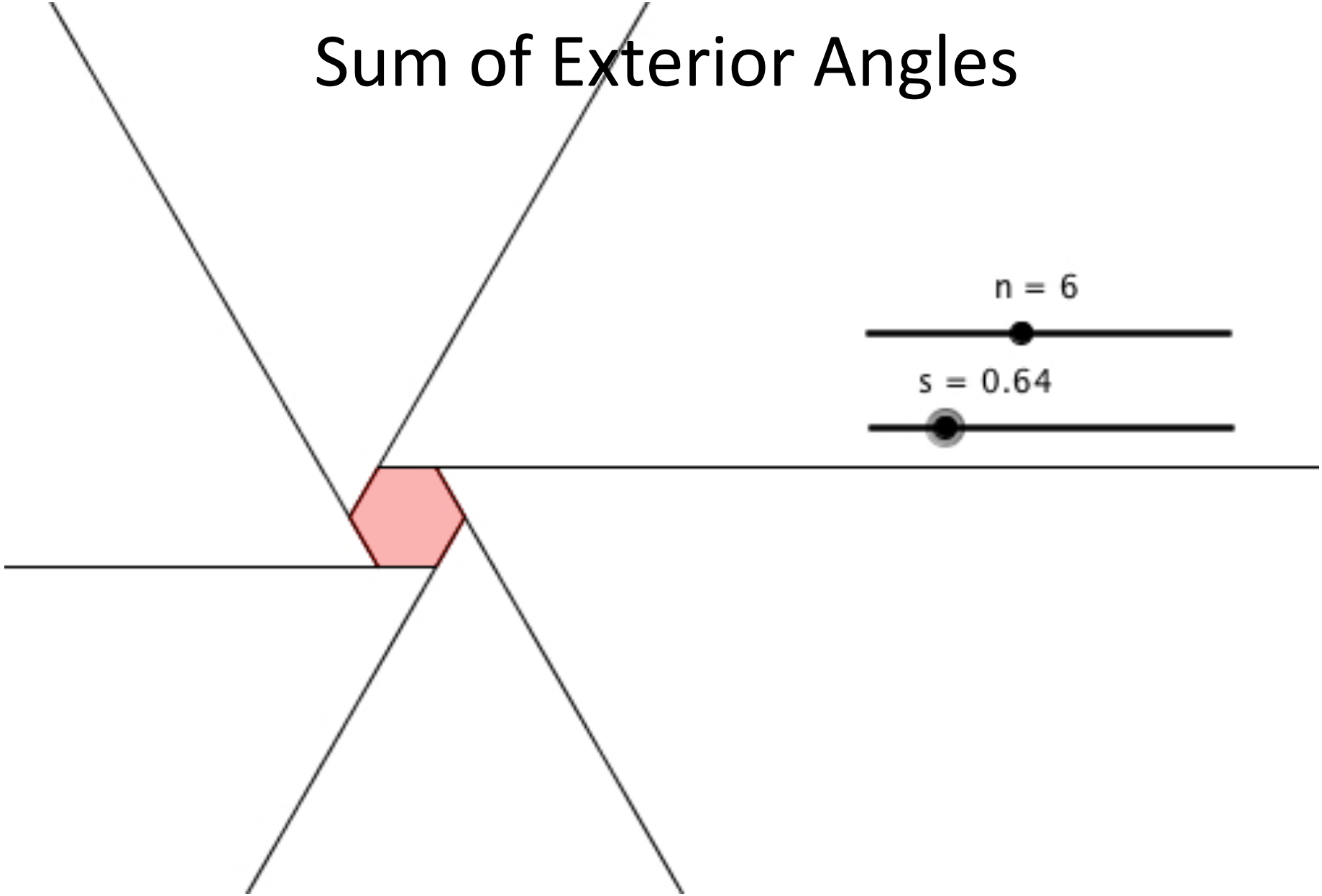
Sum of Exterior Angles



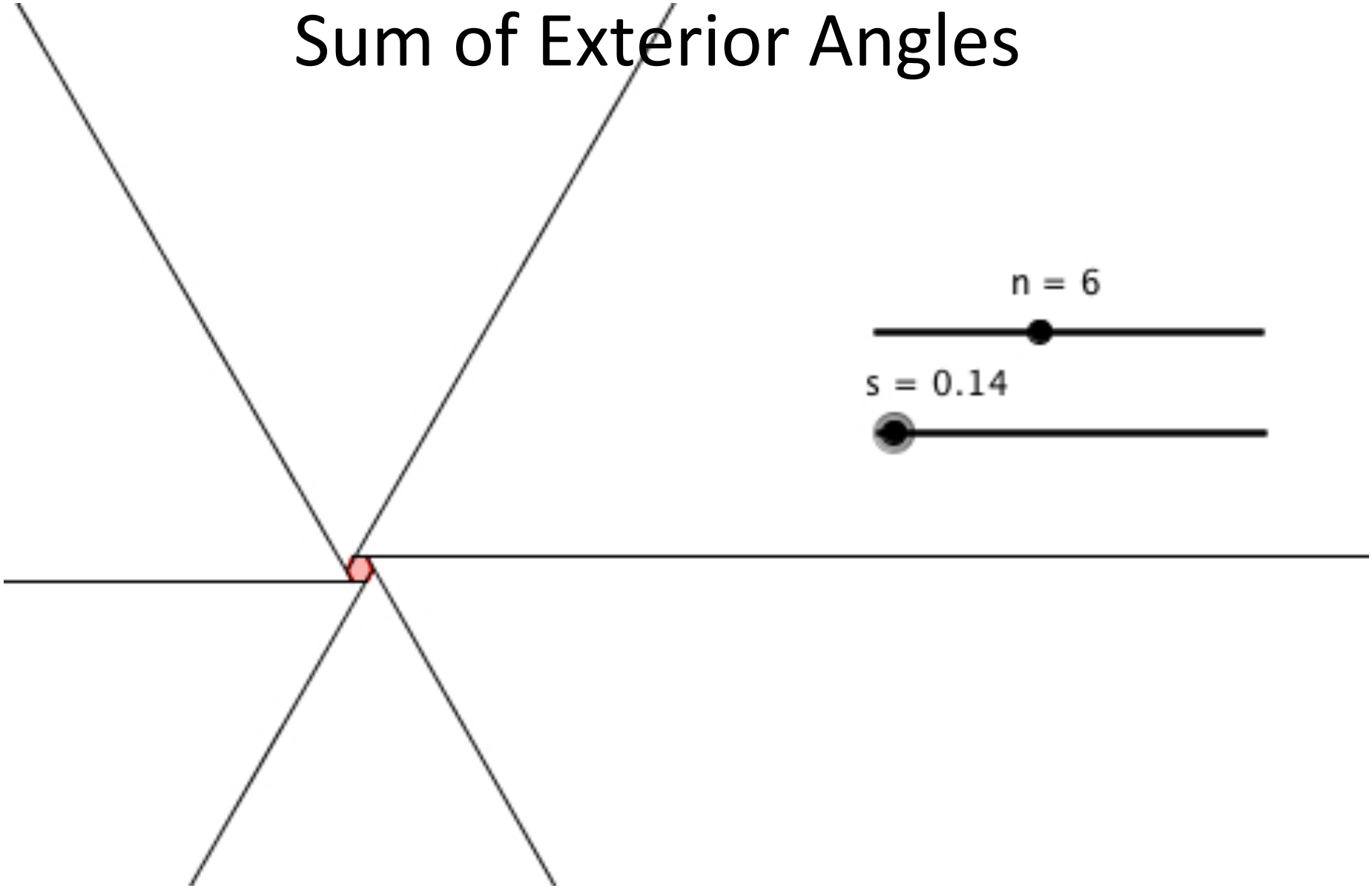
Sum of Exterior Angles



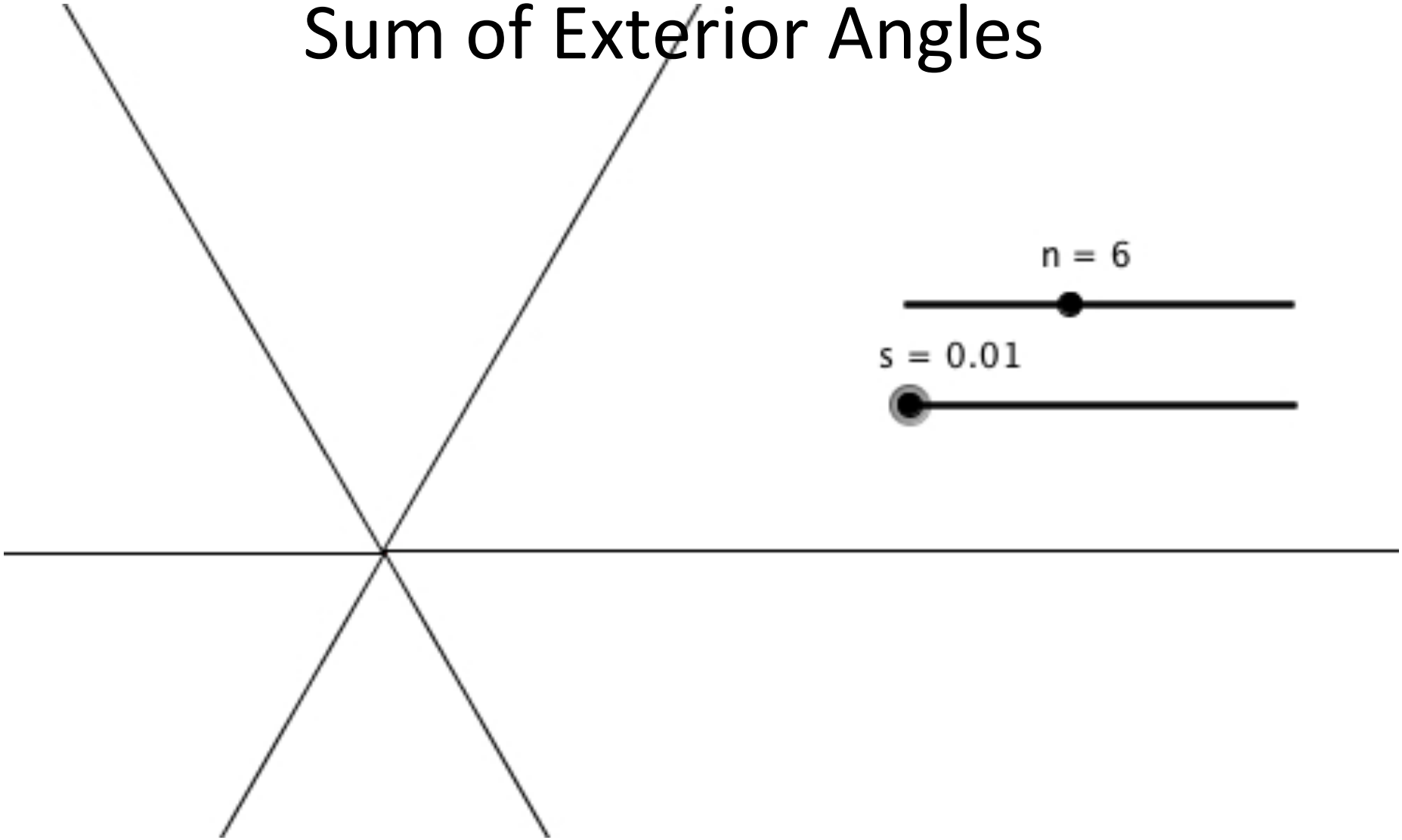
Sum of Exterior Angles



Sum of Exterior Angles



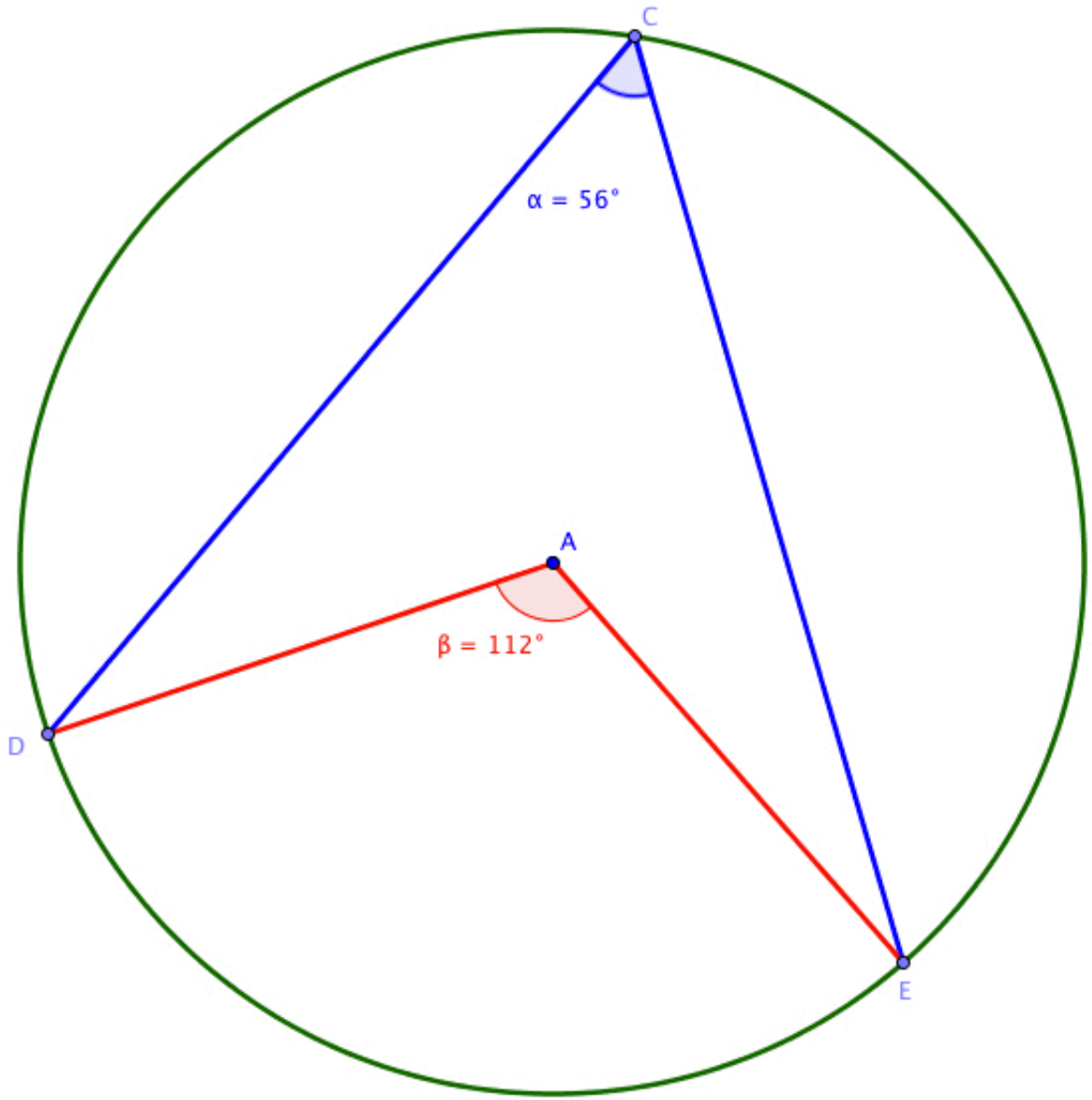
Sum of Exterior Angles



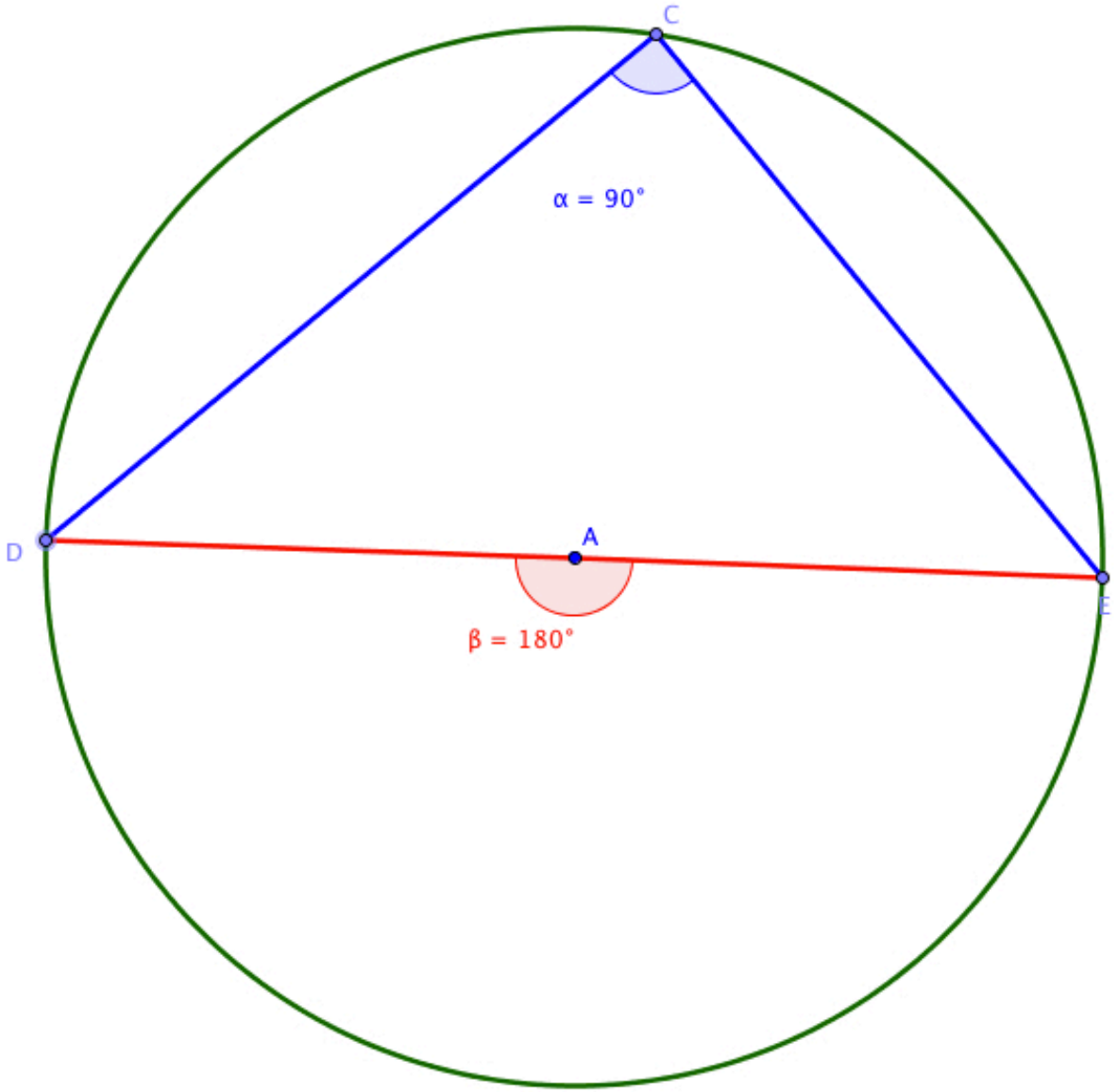
Measure of each Interior Angle of a Regular Polygon

$$\frac{(n-2)180}{n} \quad or \quad 180 - \frac{360}{n}$$

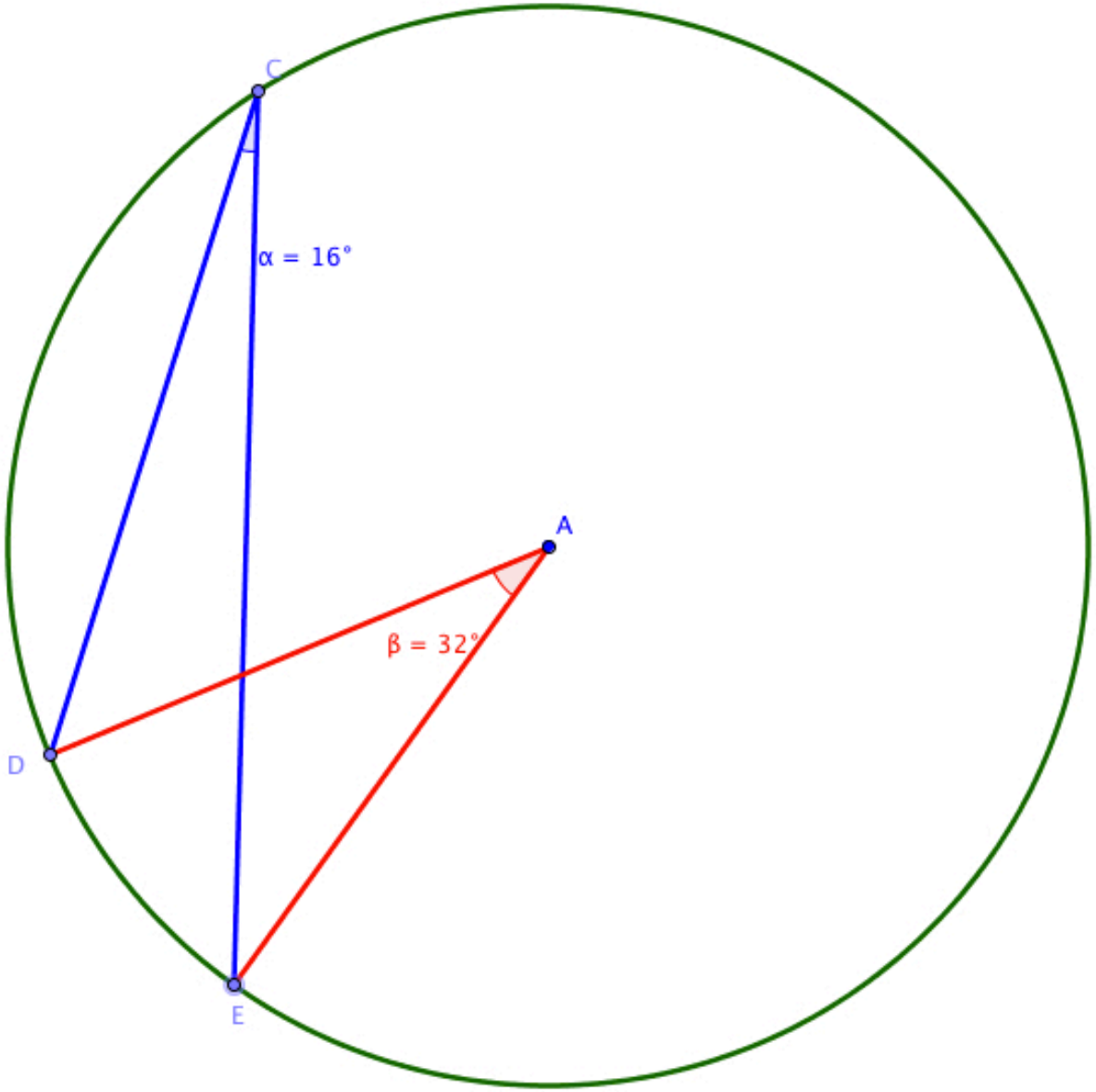
Inscribed Angles Central Angles



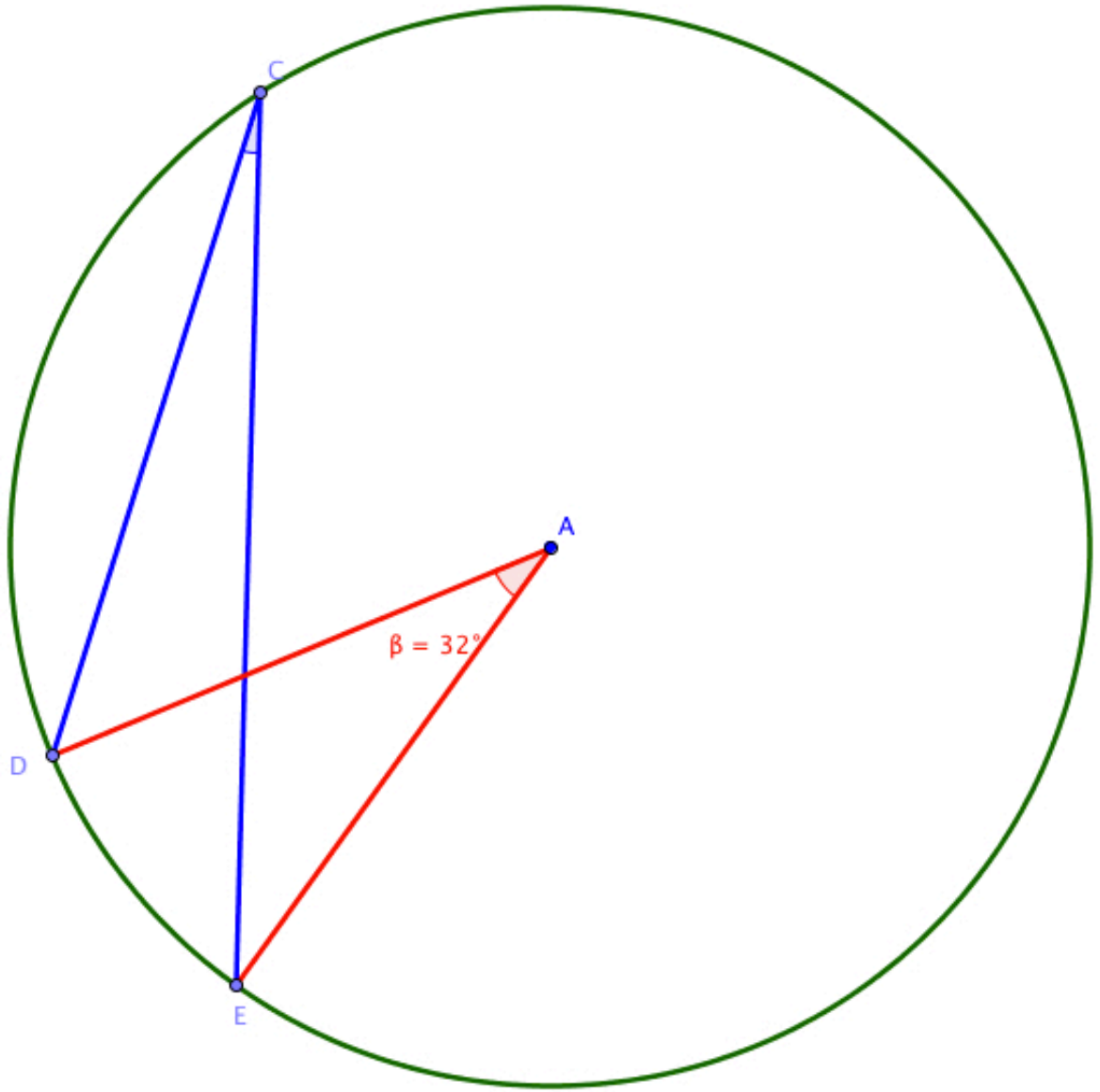
Inscribed Angles Central Angles



Inscribed Angles Central Angles



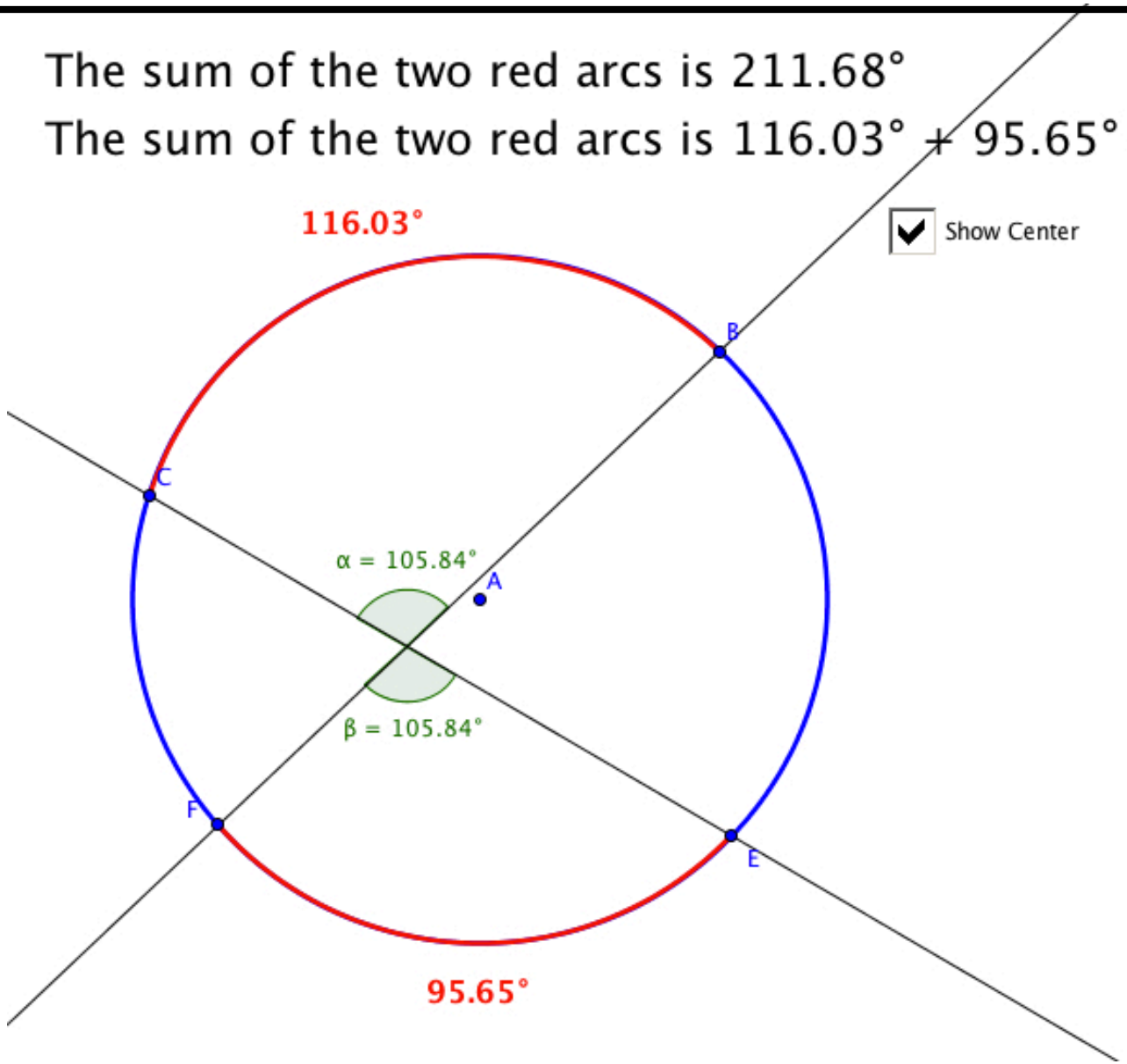
Inscribed Angles Central Angles

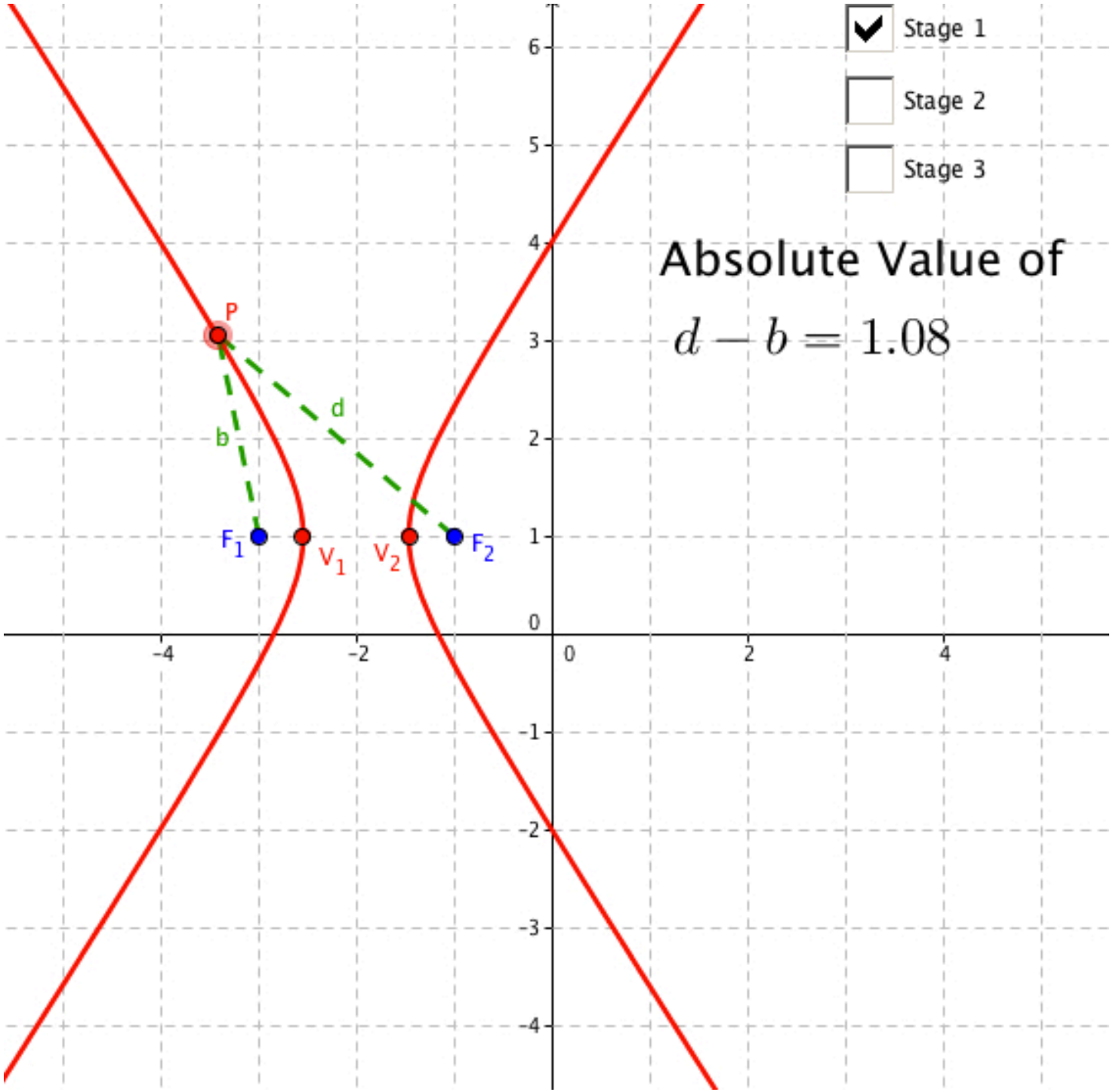


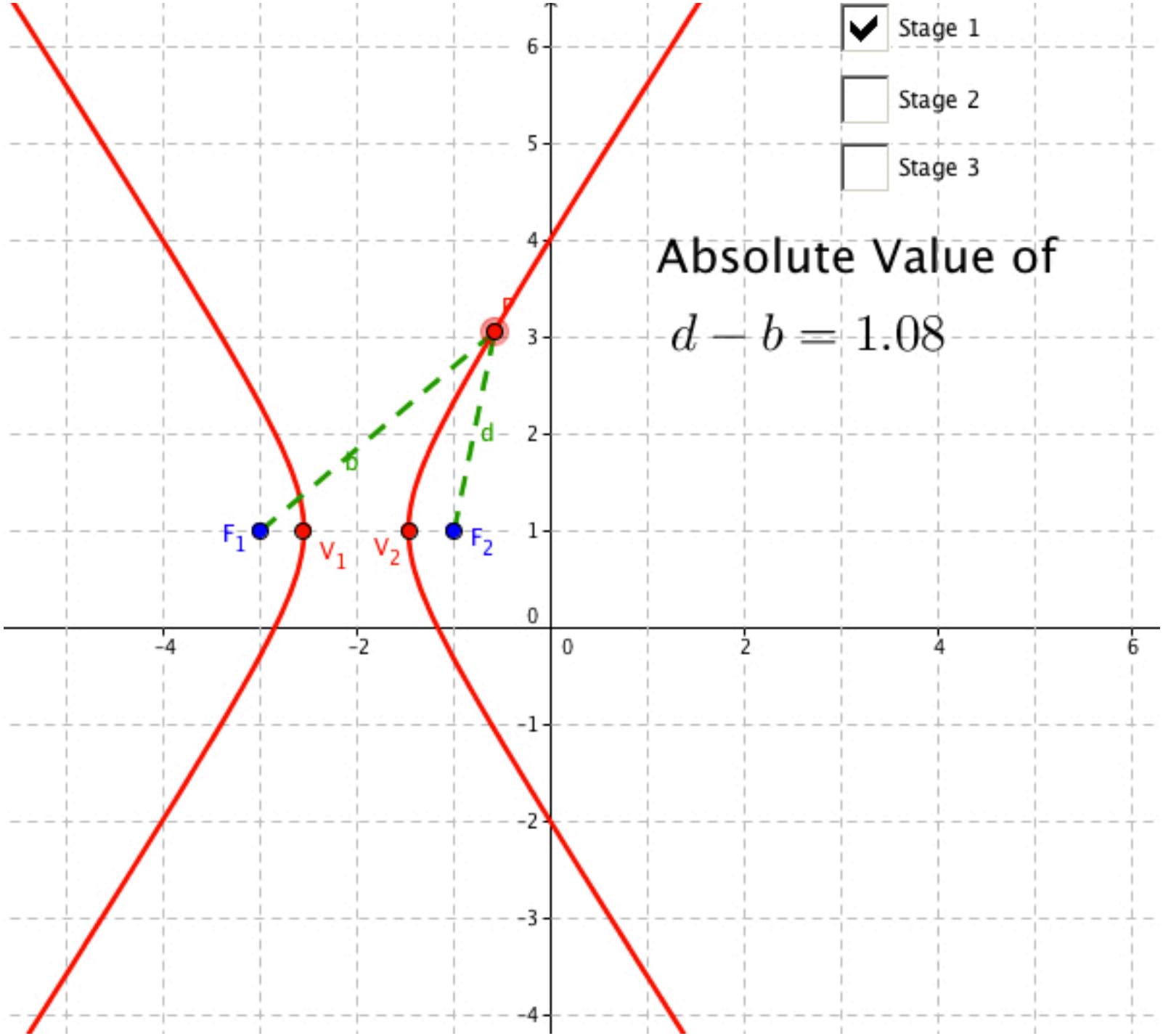
Secant - Angles

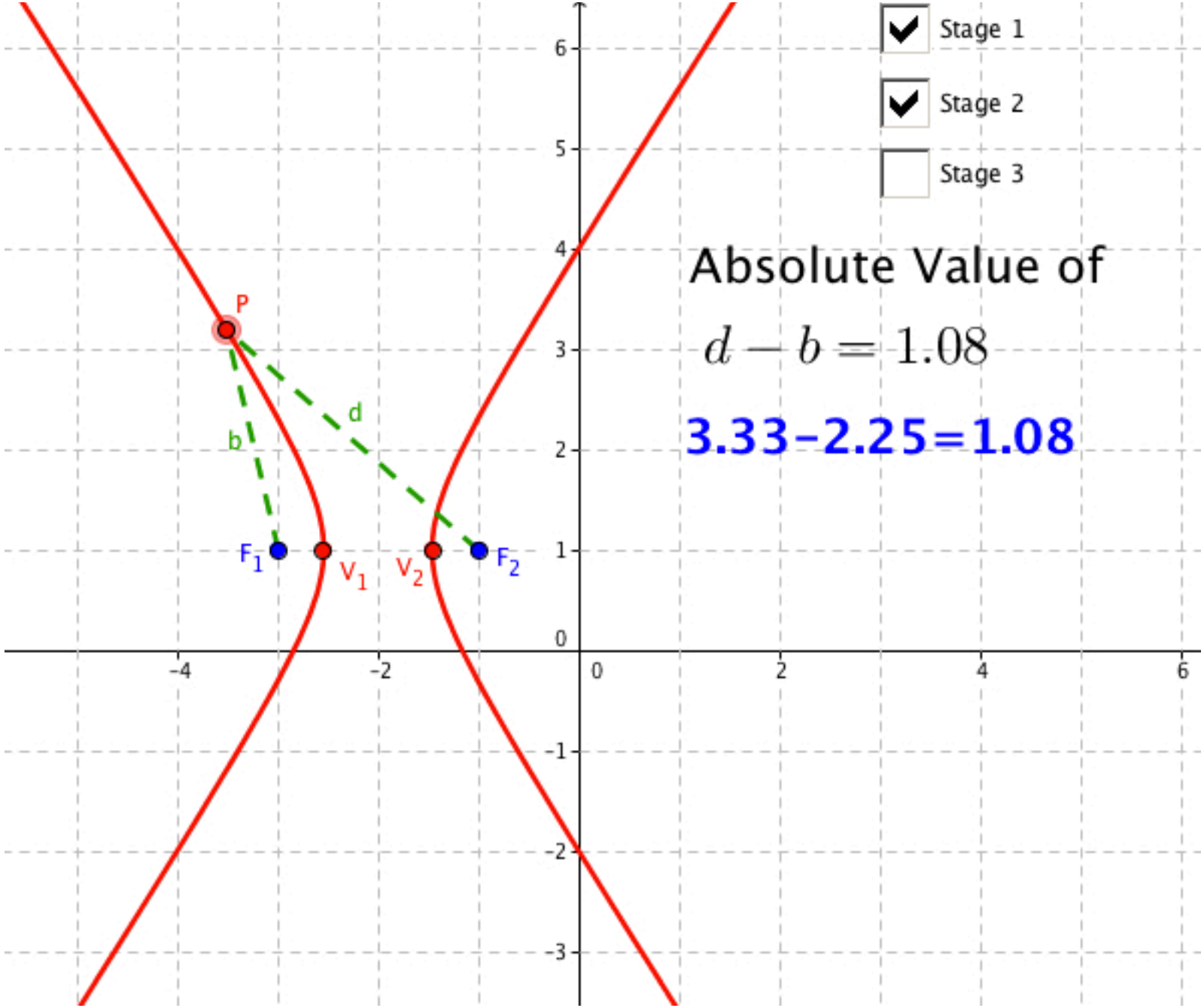
The sum of the two red arcs is 211.68°

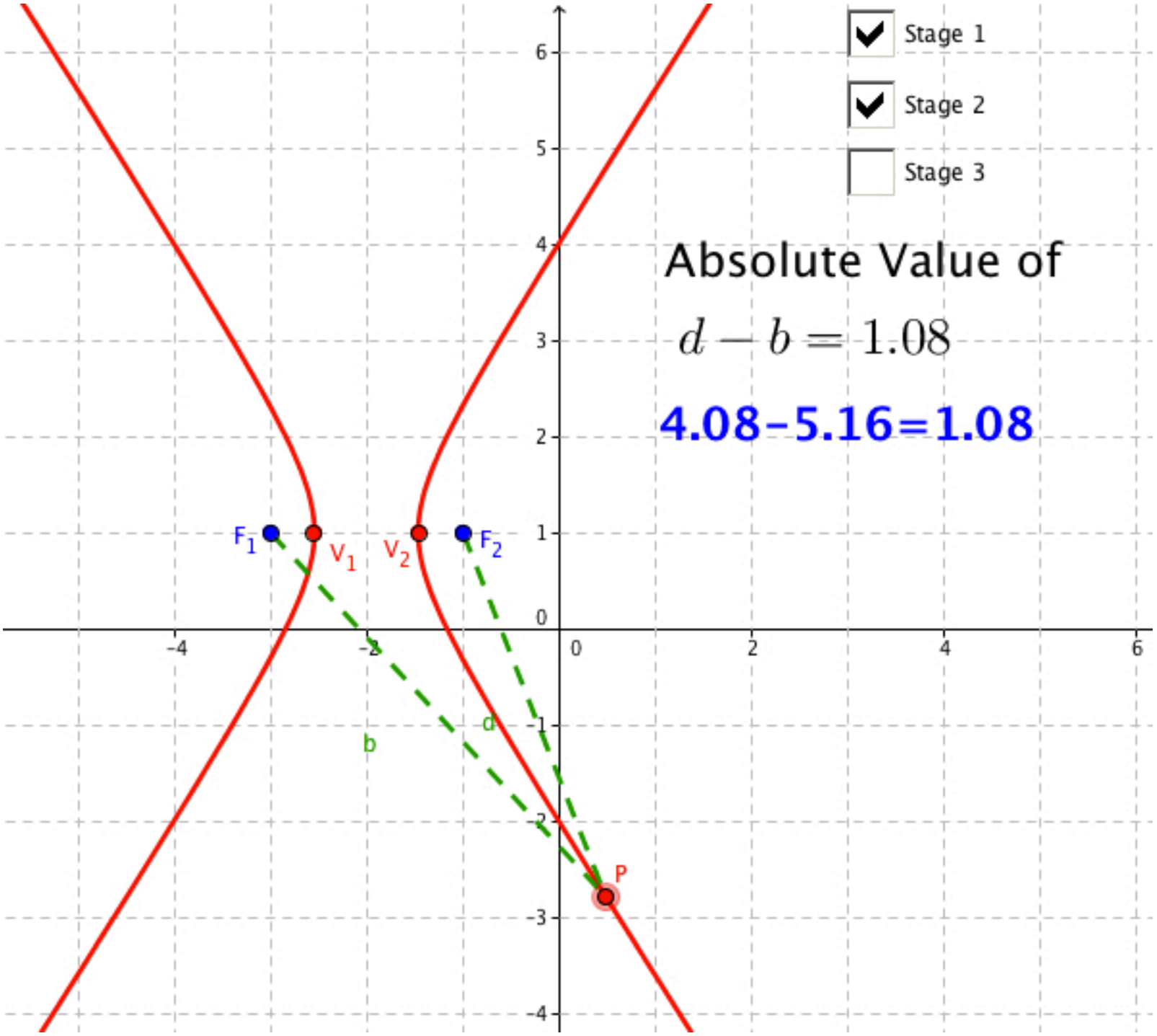
The sum of the two red arcs is 116.03° + 95.65° = 211.68°



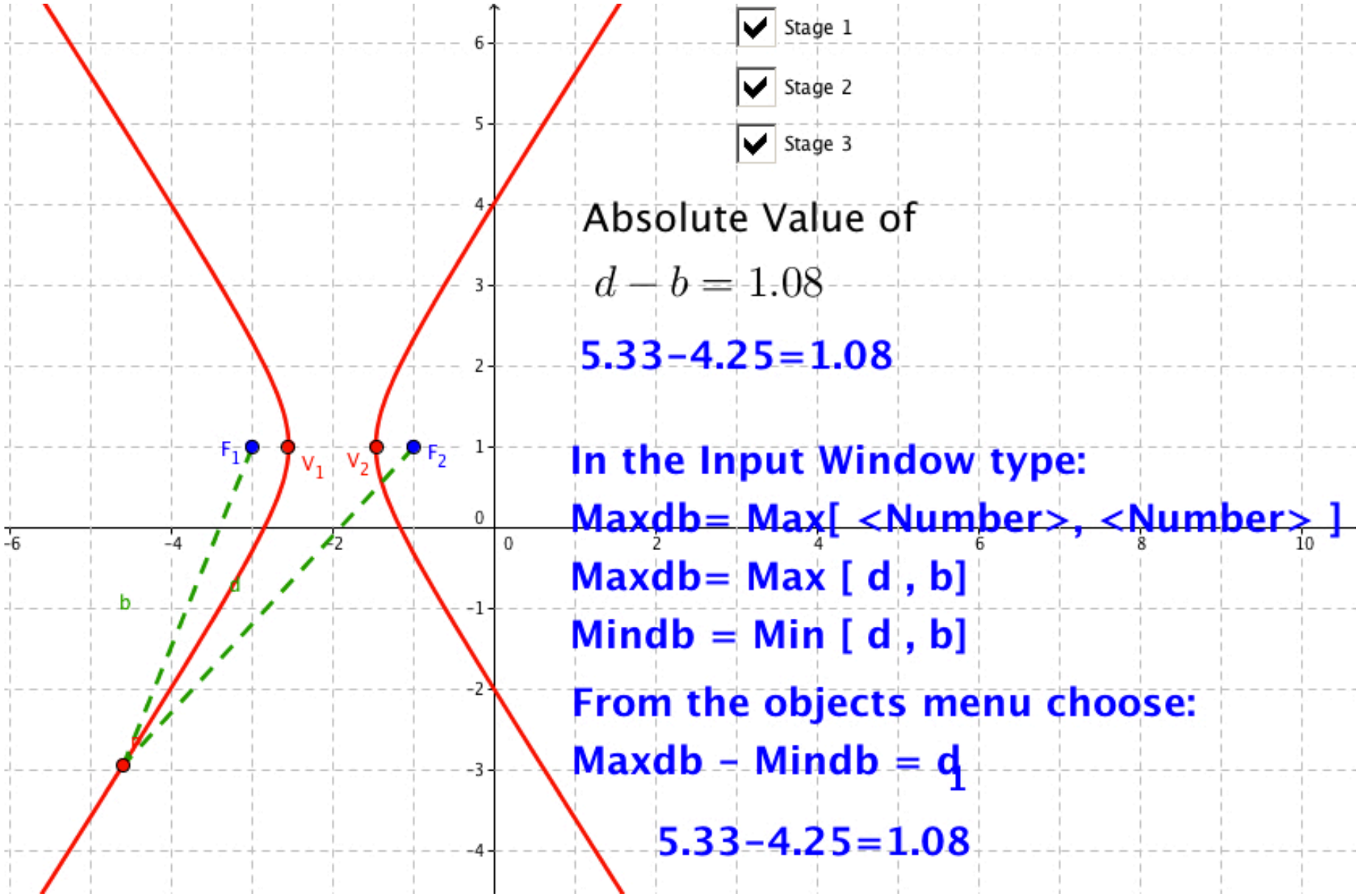

Stage 1
Stage 2
Stage 3
Absolute Value of
$d - b = 1.08$
P
d
b
F_1
V_1
V_2
F_2
6
5
4
3
2
1
0
-1
-2
-3
-4
-4
-2
0
2
4

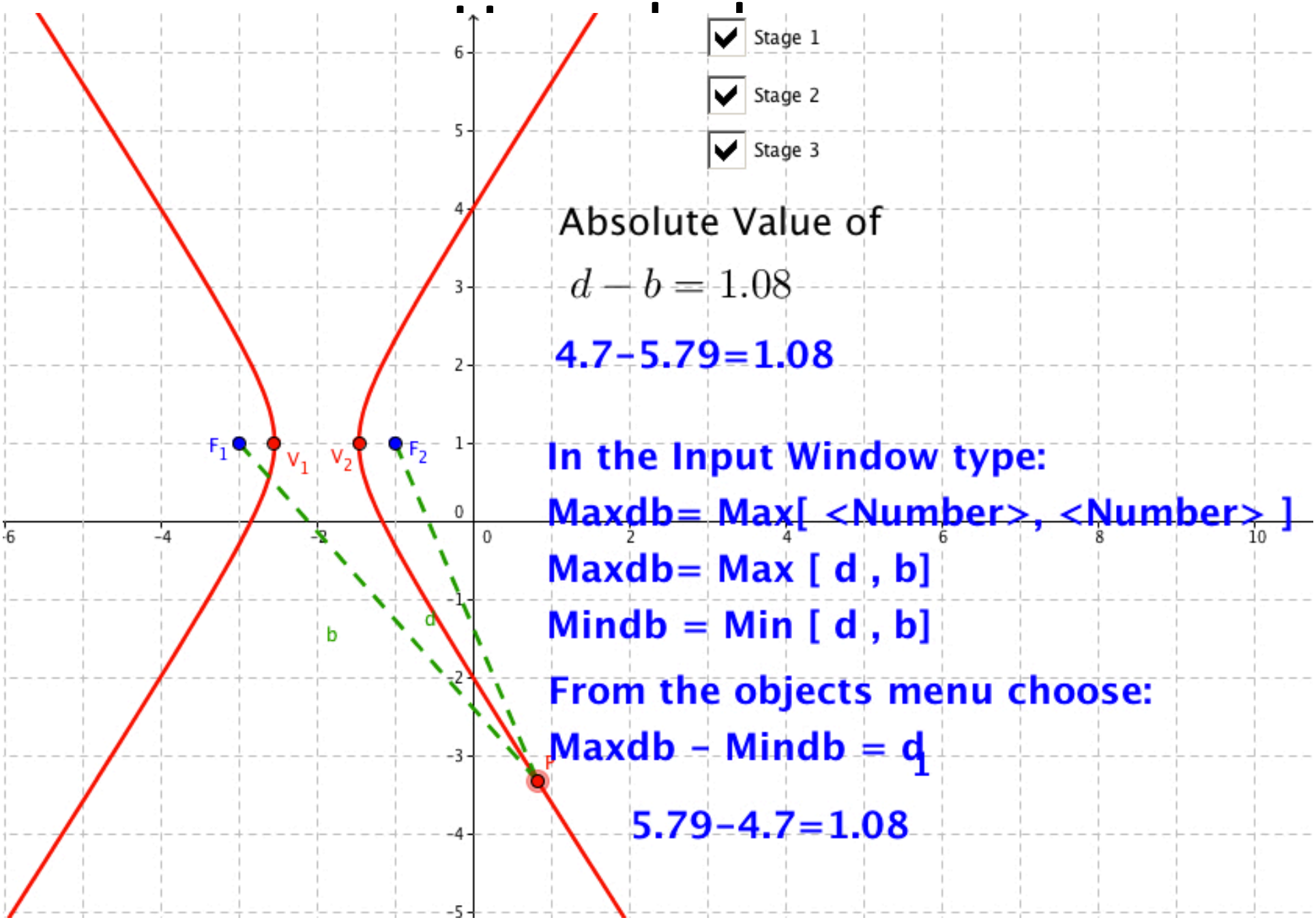

Stage 1
Stage 2
Stage 3
Absolute Value of
$d - b = 1.08$
P
b
d
F_1
V_1
V_2
F_2
6
5
4
3
2
1
0
-1
-2
-3
-4
-4
-2
0
2
4
6

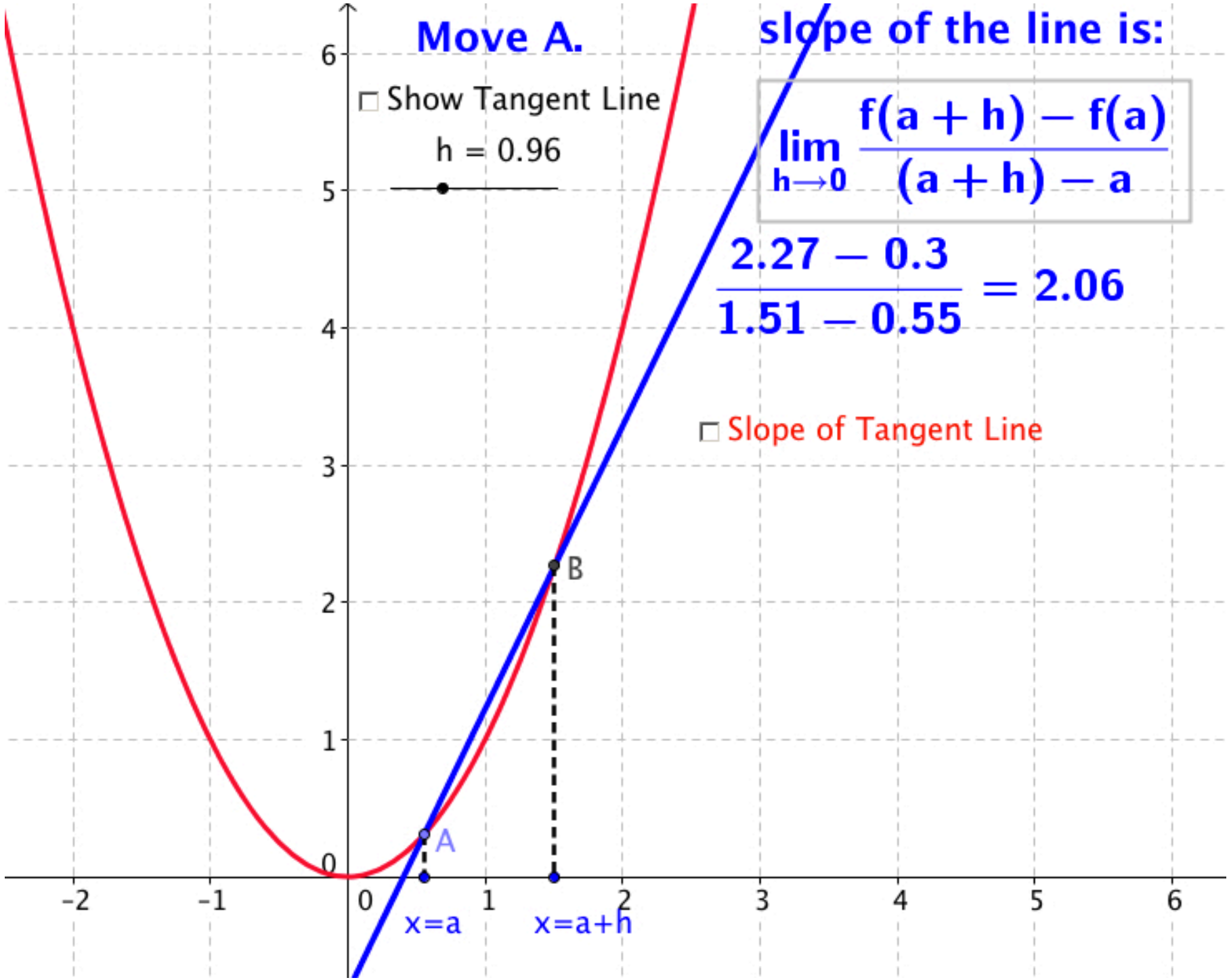

Stage 1
Stage 2
Stage 3
Absolute Value of
$d - b = 1.08$
3.33-2.25=1.08
P
b
d
F_1
V_1
V_2
F_2
6
5
4
3
2
1
0
-1
-2
-3
-4
-2
0
2
4
6

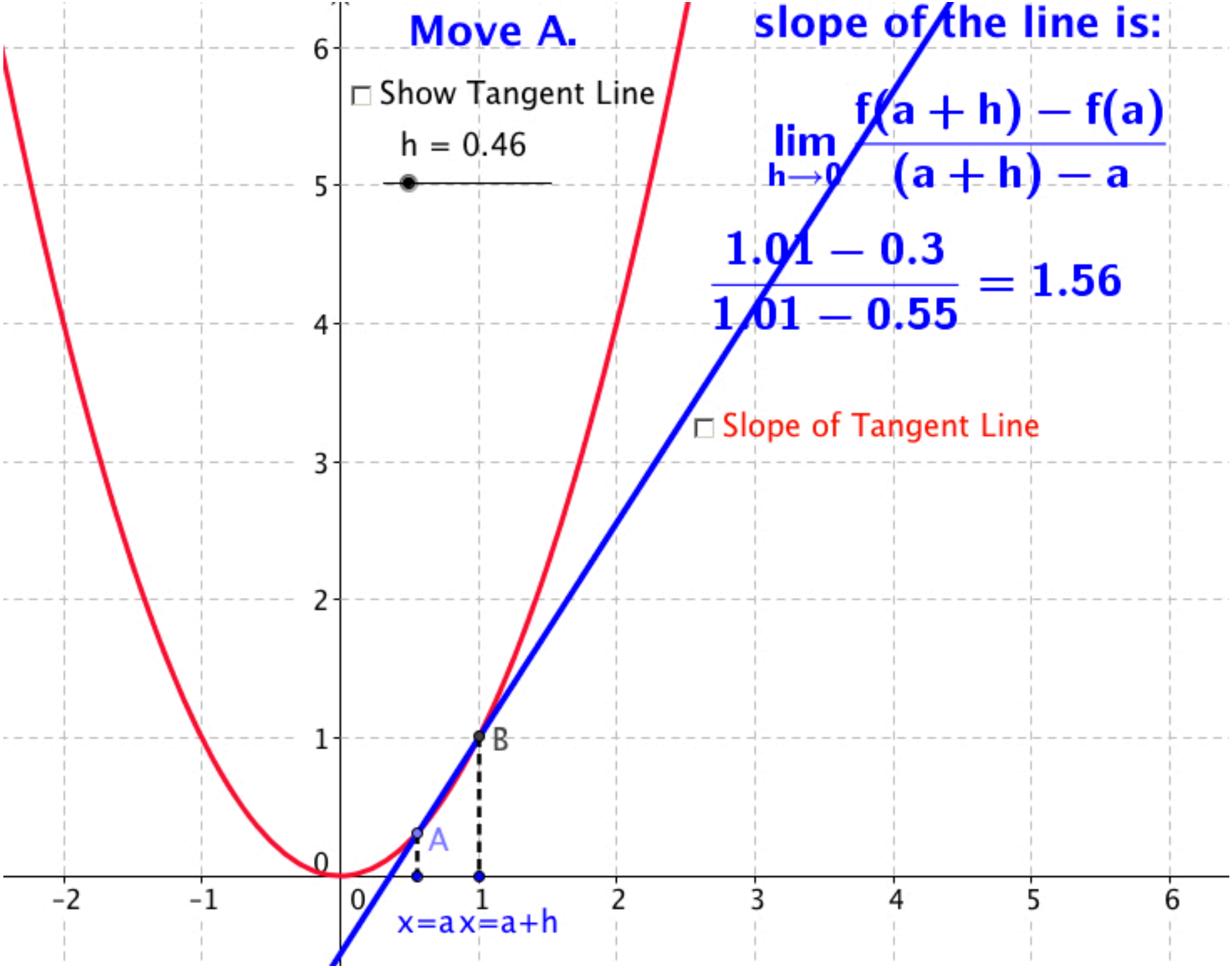

Stage 1
Stage 2
Stage 3
Absolute Value of
$d - b = 1.08$
4.08-5.16=1.08
F1
V1
V2
F2
P
b
d
6
5
4
3
2
1
0
-1
-2
-3
-4
-4
-2
0
2
4
6

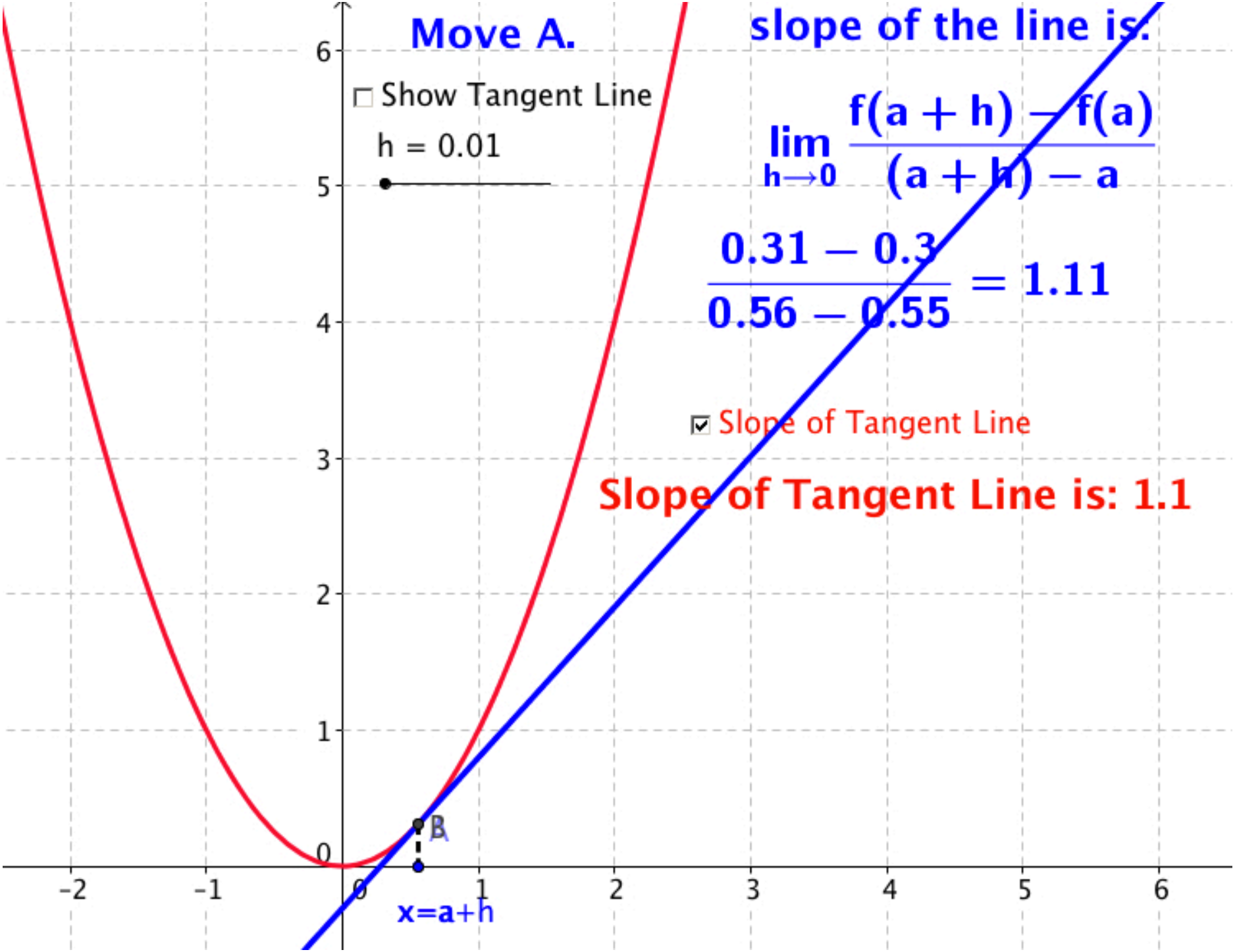
Hyperbolas


Stage 1
Stage 2
Stage 3
Absolute Value of
$d - b = 1.08$
5.33-4.25=1.08
In the Input Window type:
Maxdb= Max[<Number>, <Number>]
Maxdb= Max [d , b]
Mindb = Min [d , b]
From the objects menu choose:
Maxdb - Mindb = d1
5.33-4.25=1.08
F1
V1
V2
F2
b
d

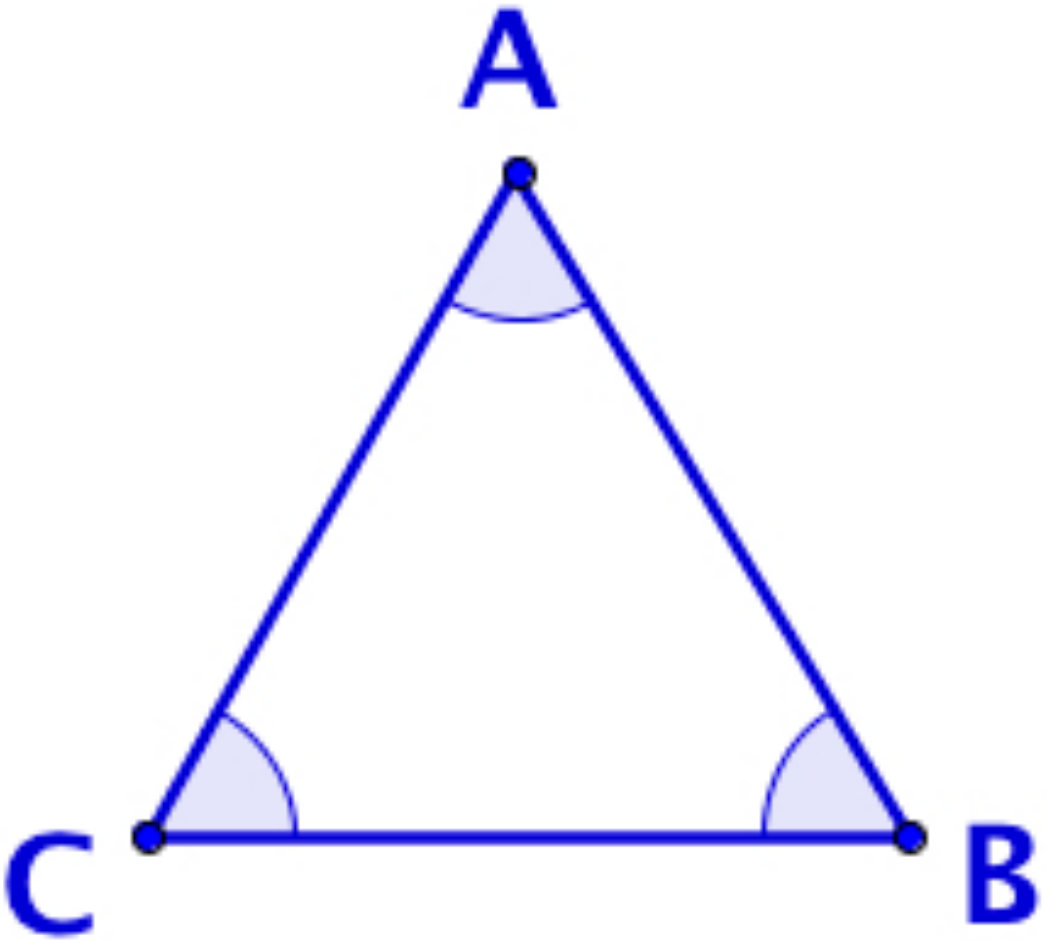

Stage 1
Stage 2
Stage 3
Absolute Value of
$d - b = 1.08$
4.7-5.79=1.08
In the Input Window type:
Maxdb= Max[<Number>, <Number>]
Maxdb= Max [d , b]
Mindb = Min [d , b]
From the objects menu choose:
Maxdb - Mindb = d
1
5.79-4.7=1.08
F1
V1
V2
F2
P
b
d


Move A.
Show Tangent Line
h = 0.96
slope of the line is:
$\lim_{h \to 0} \frac{f(a+h) - f(a)}{(a+h) - a}$
$\frac{2.27 - 0.3}{1.51 - 0.55} = 2.06$
Slope of Tangent Line
A
B
x=a
x=a+h
6
5
4
3
2
1
0
-2
-1
0
1
2
3
4
5
6

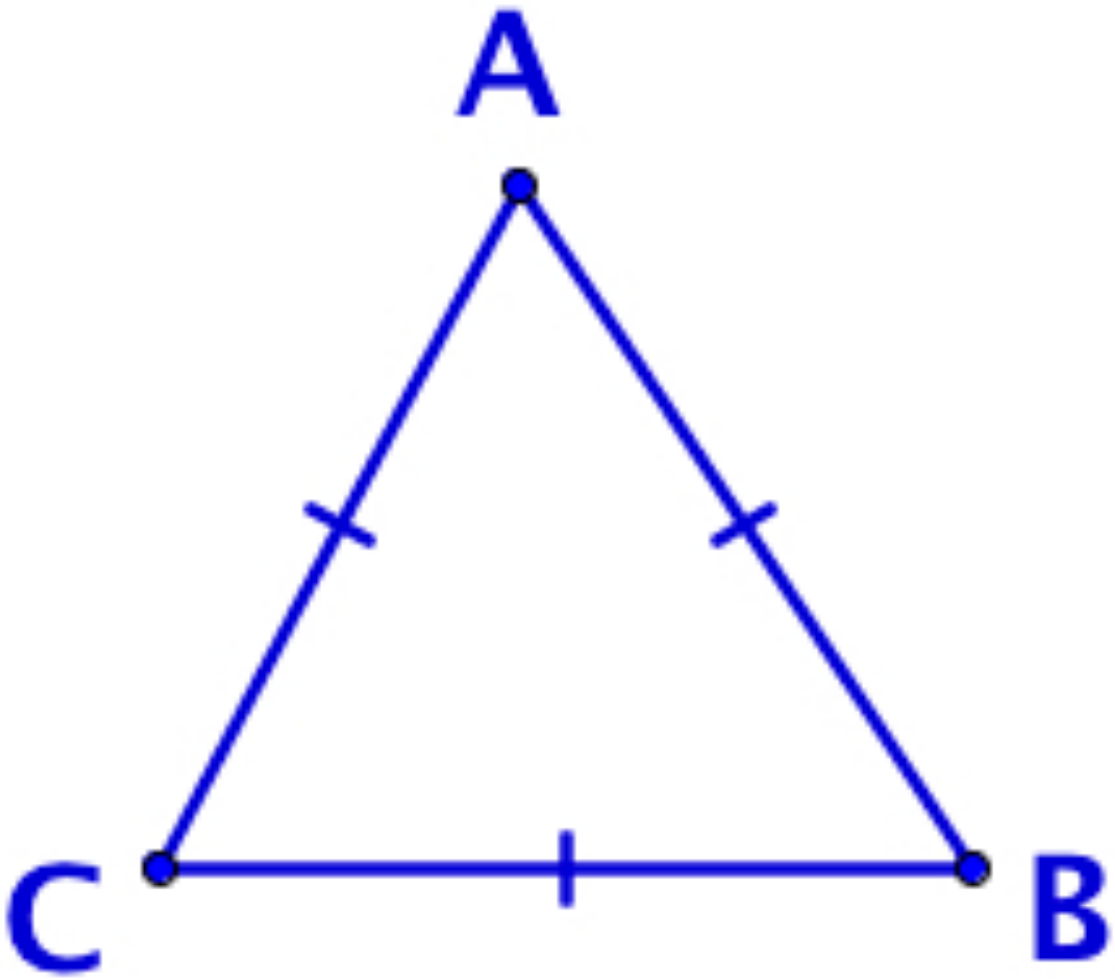

Move A.
Show Tangent Line
h = 0.46
slope of the line is:
$\lim_{h \to 0} \frac{f(a+h) - f(a)}{(a+h) - a}$
$\frac{1.01 - 0.3}{1.01 - 0.55} = 1.56$
Slope of Tangent Line
A
B
x=a
x=a+h
-2
-1
0
1
2
3
4
5
6


Move A.
Show Tangent Line
h = 0.01
slope of the line is:
$\lim_{h \to 0} \frac{f(a+h) - f(a)}{(a+h) - a}$
$\frac{0.31 - 0.3}{0.56 - 0.55} = 1.11$
Slope of Tangent Line
Slope of Tangent Line is: 1.1
A
B
x=a+h
-2
-1
0
1
2
3
4
5
6

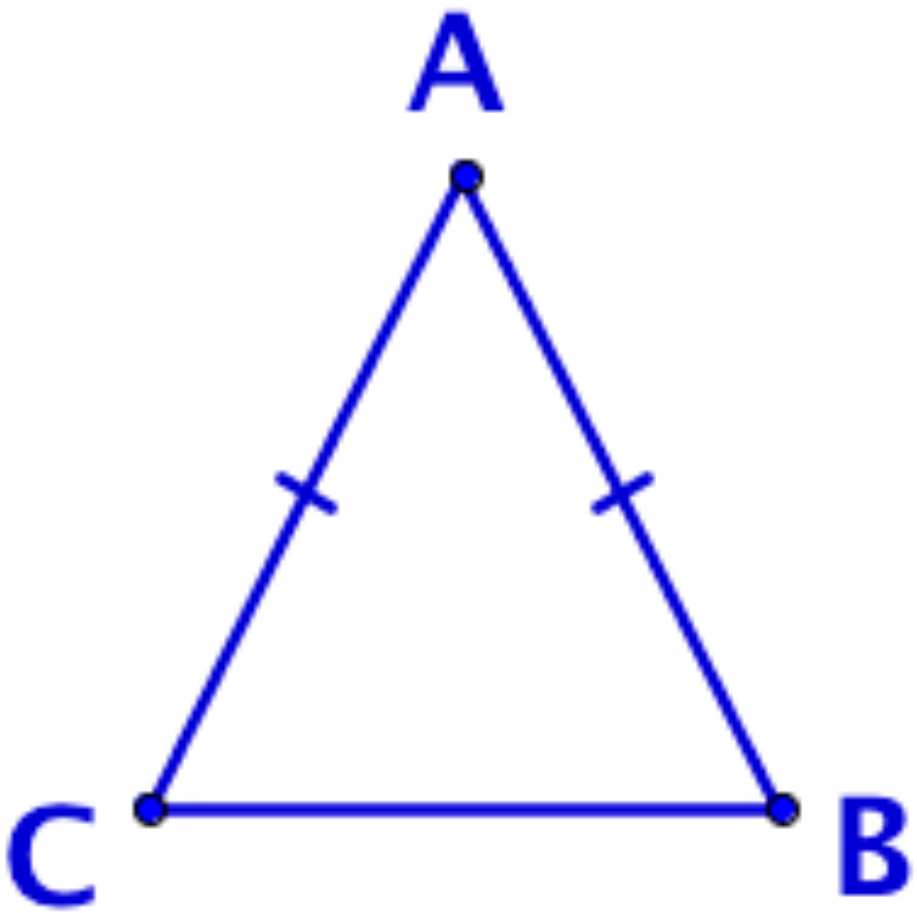
Type of Triangle



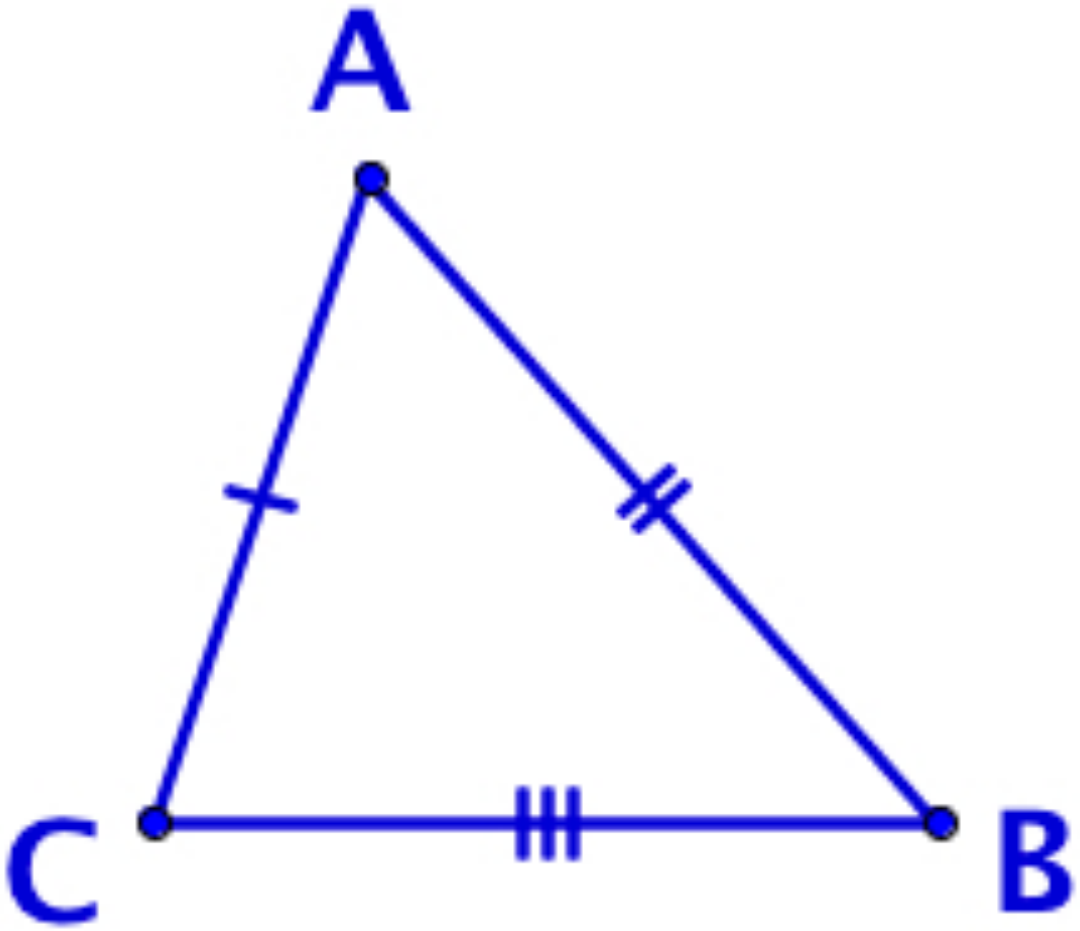
Type of Triangle



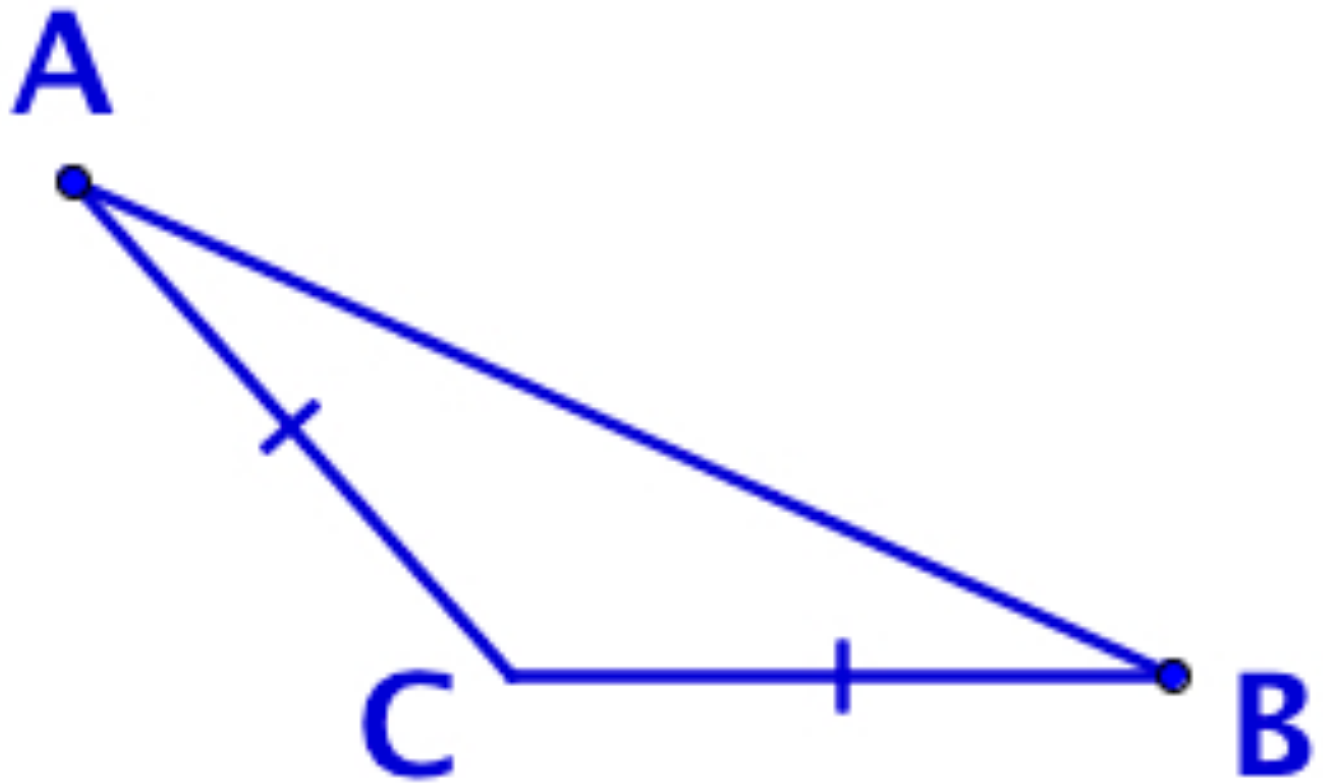
Type of Triangle



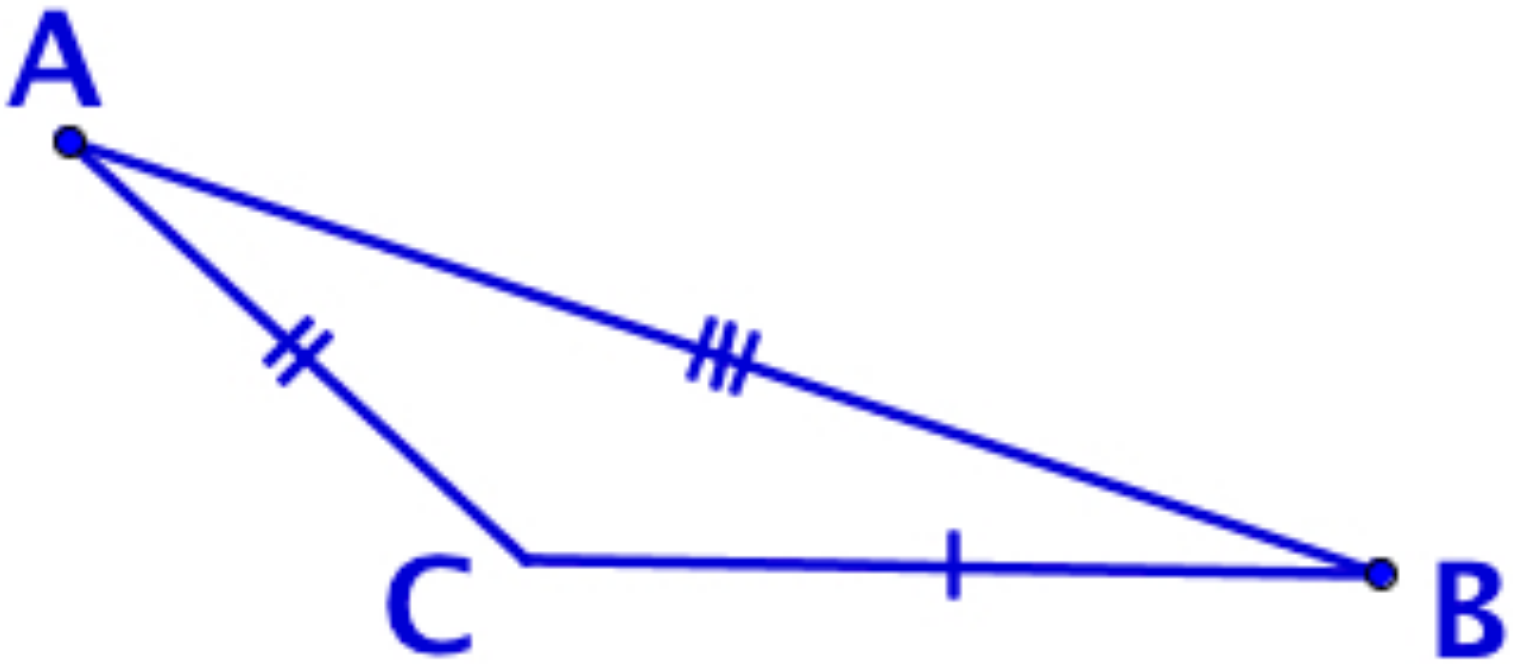
Type of Triangle



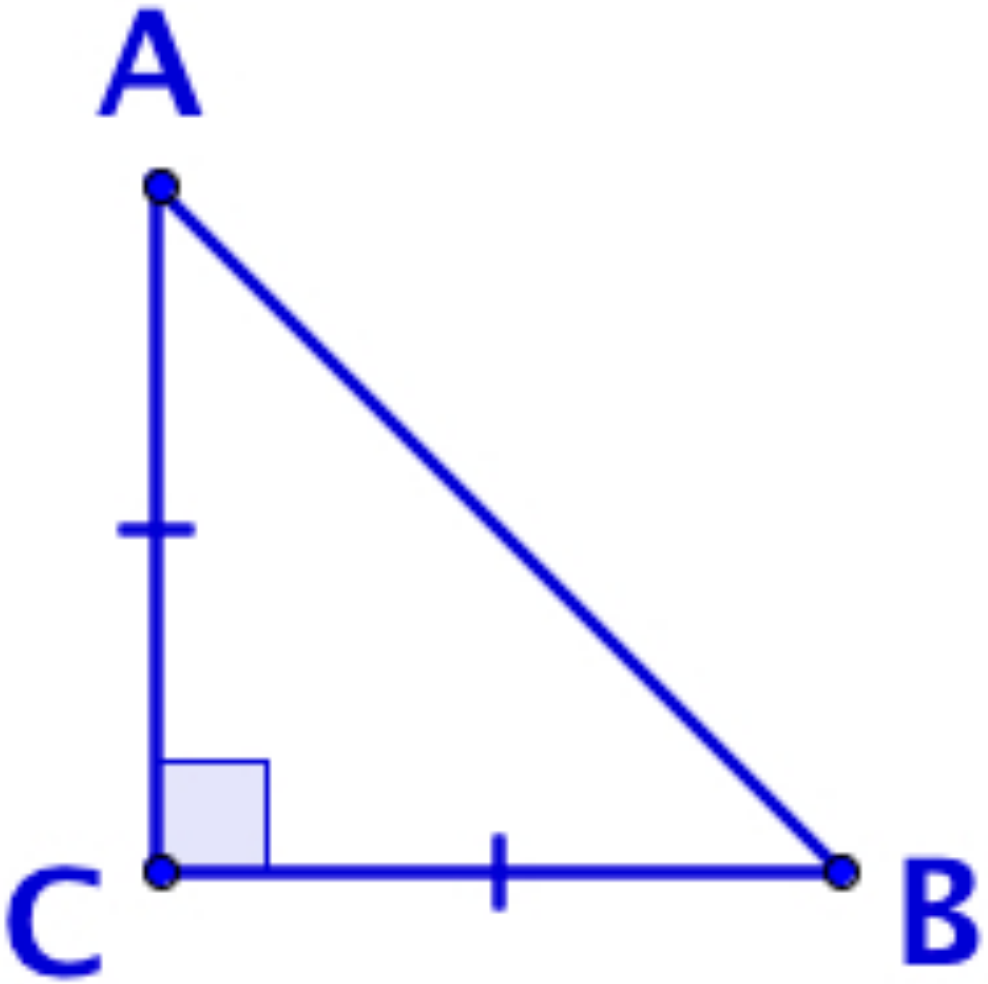
Type of Triangle



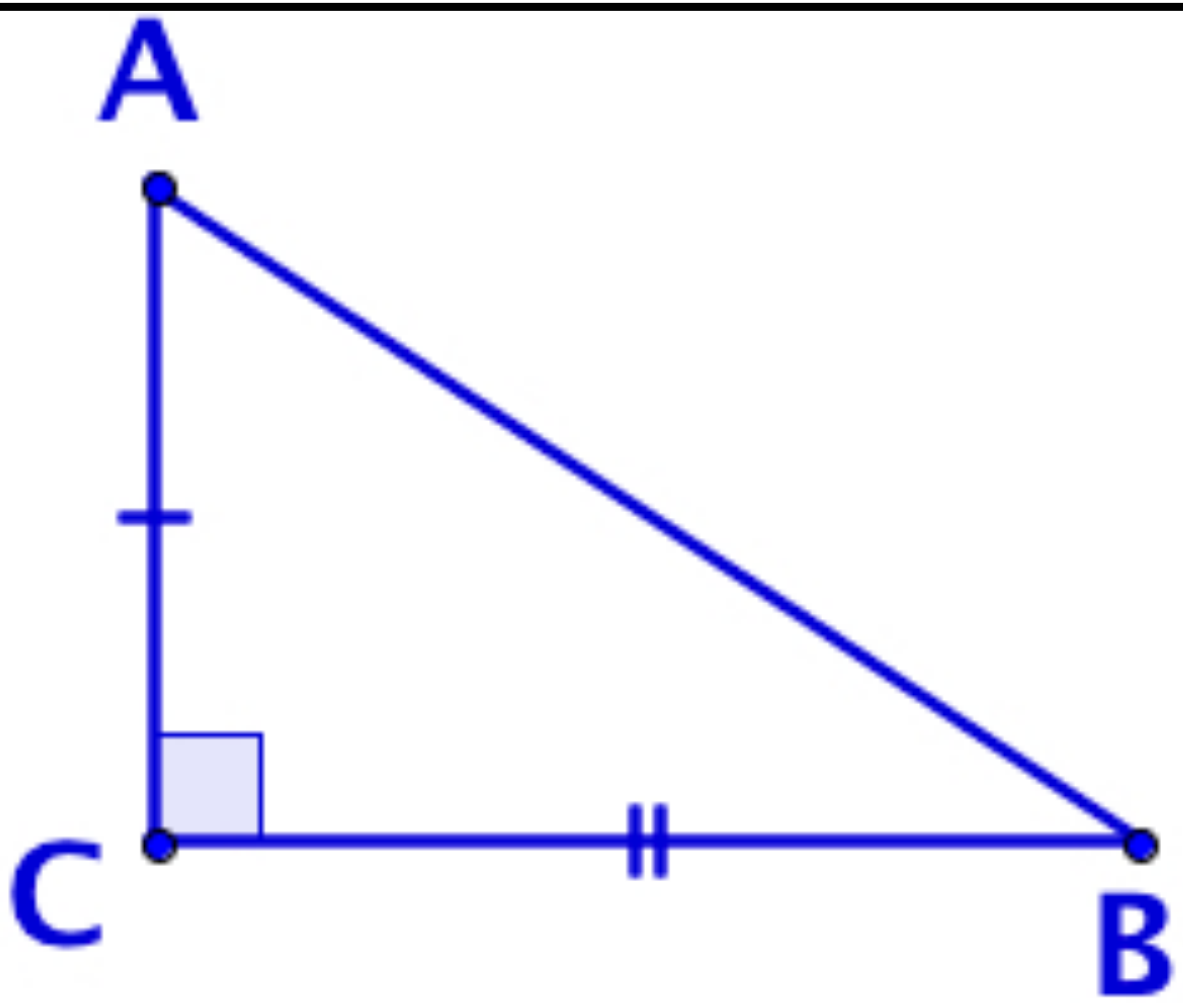
Type of Triangle



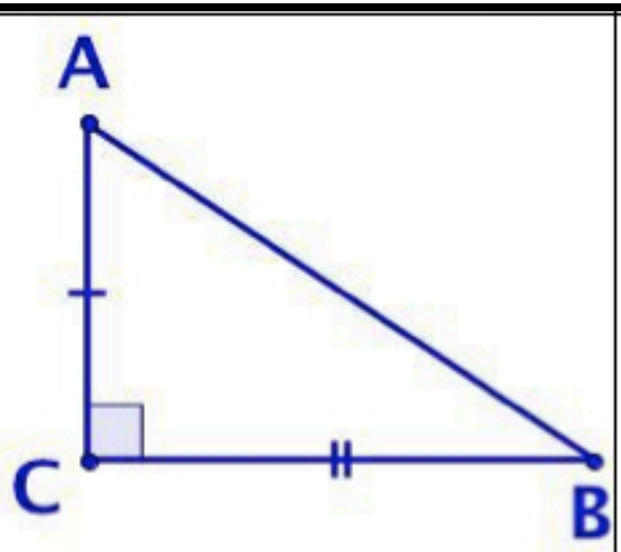
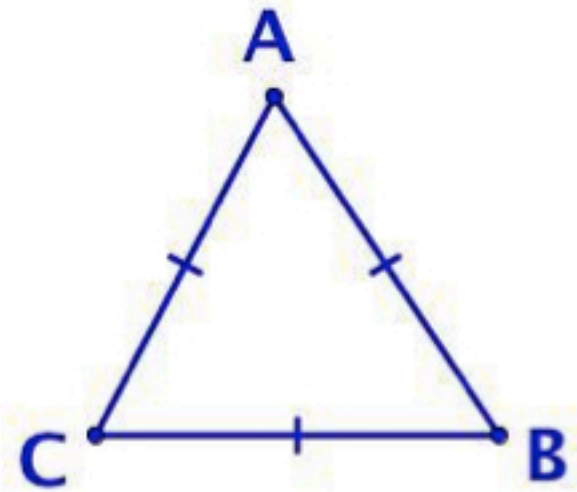
Type of Triangle



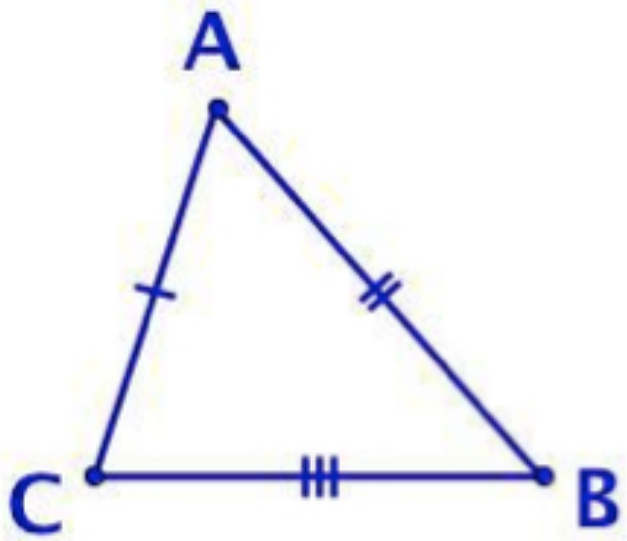
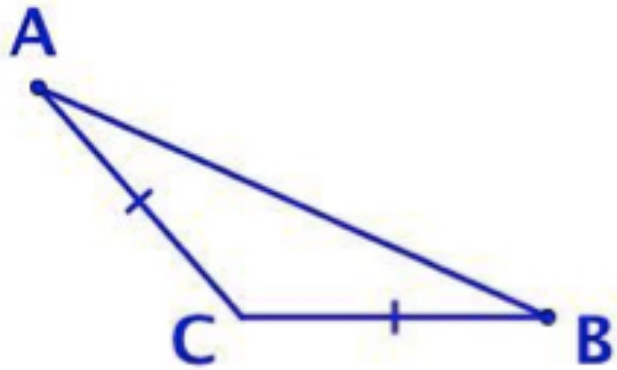
Type of Triangle



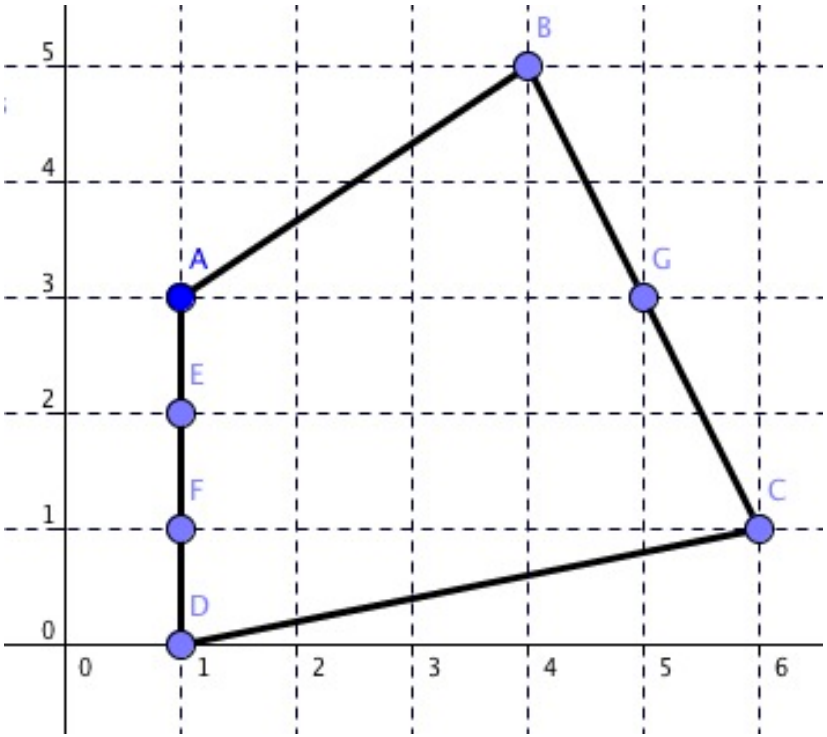
Type of Triangle

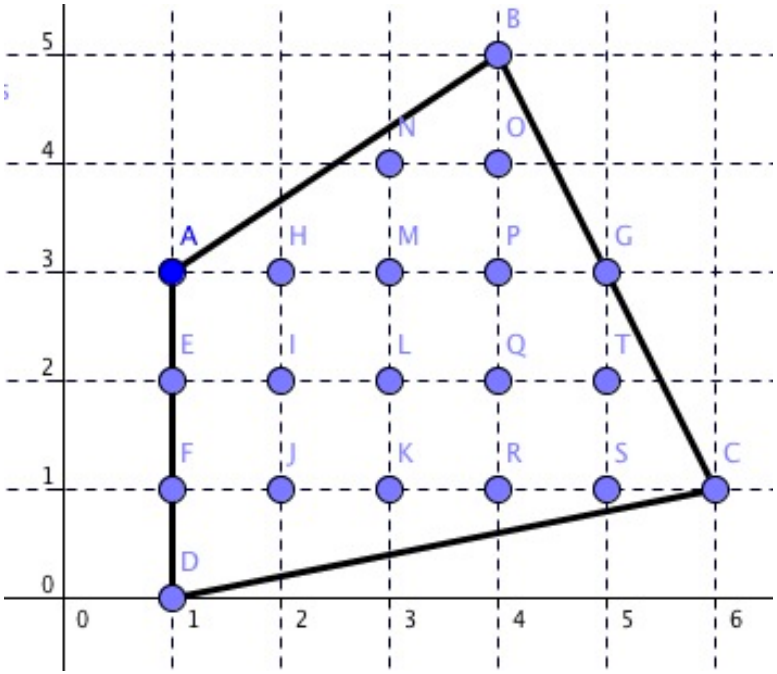
	Right Triangle	Scalene Triangle
	Acute Triangle	Equilateral Triangle

Type of Triangle

	Acute Triangle	Scalene Triangle
	Obtuse Triangle	Isosceles Triangle

Pick's Theorem



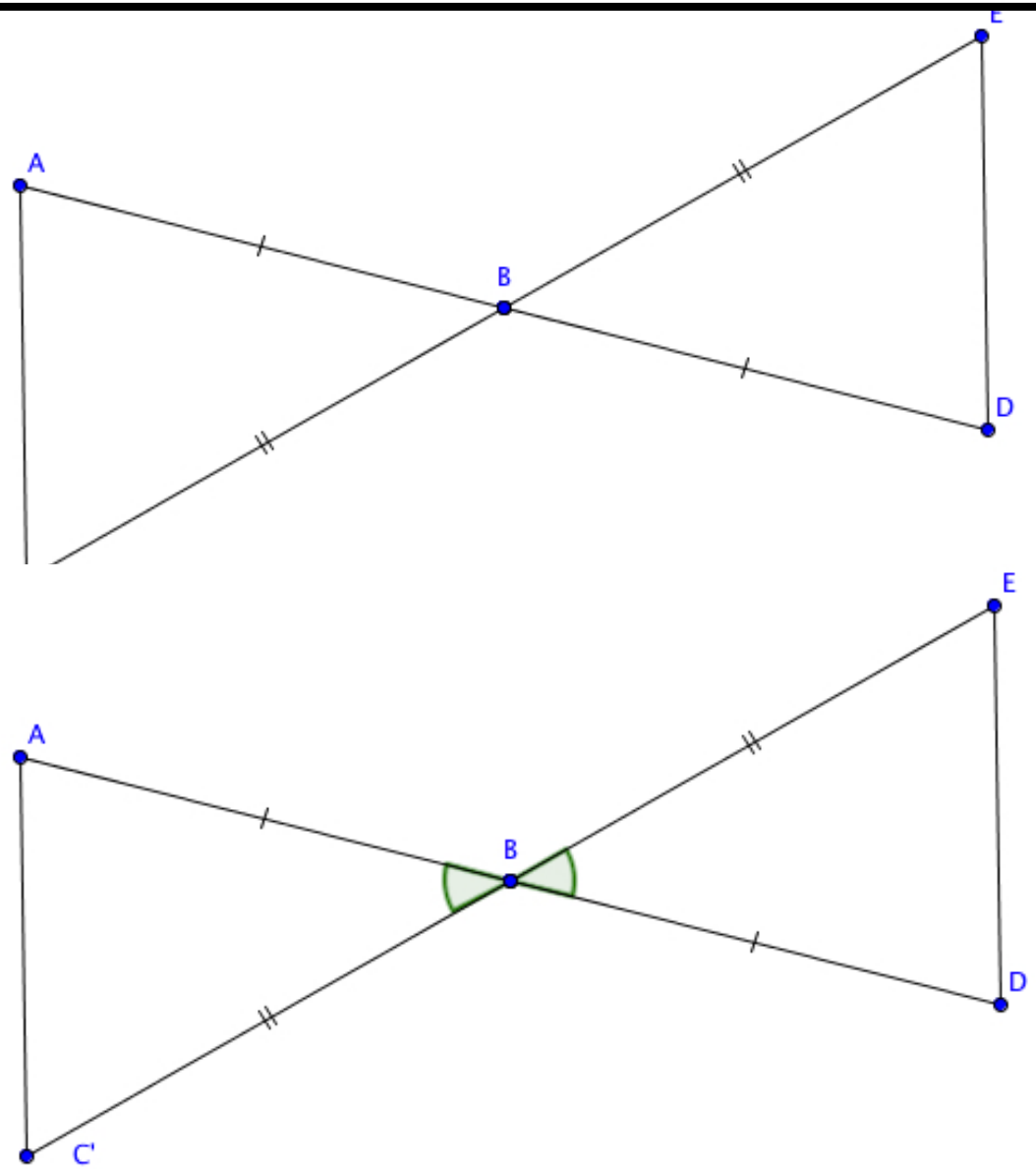


Boundary Points = 7

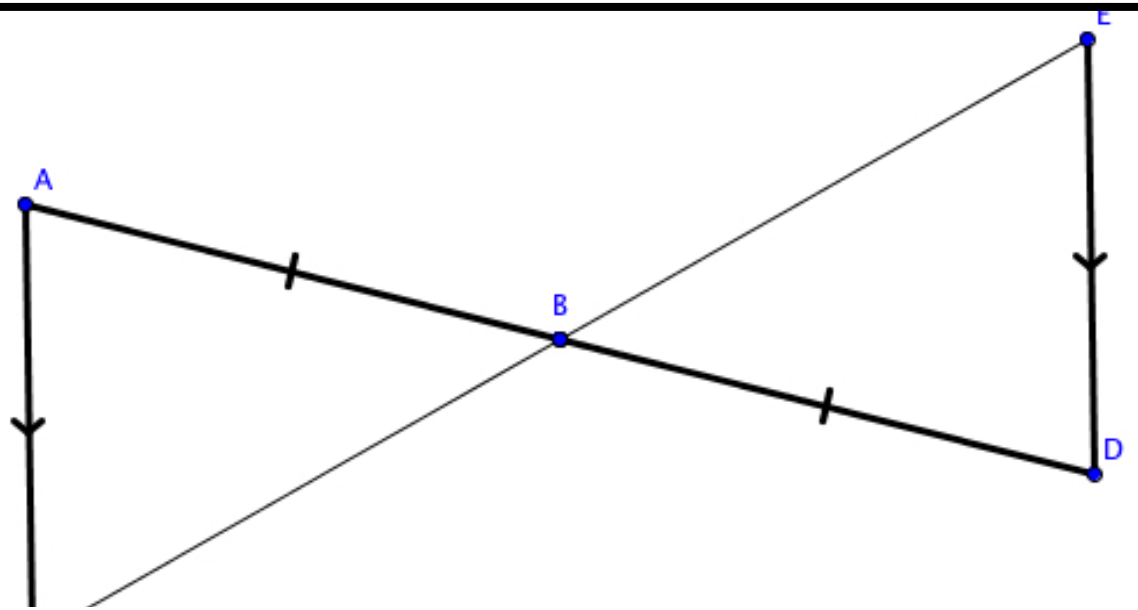
Interior Points = 13

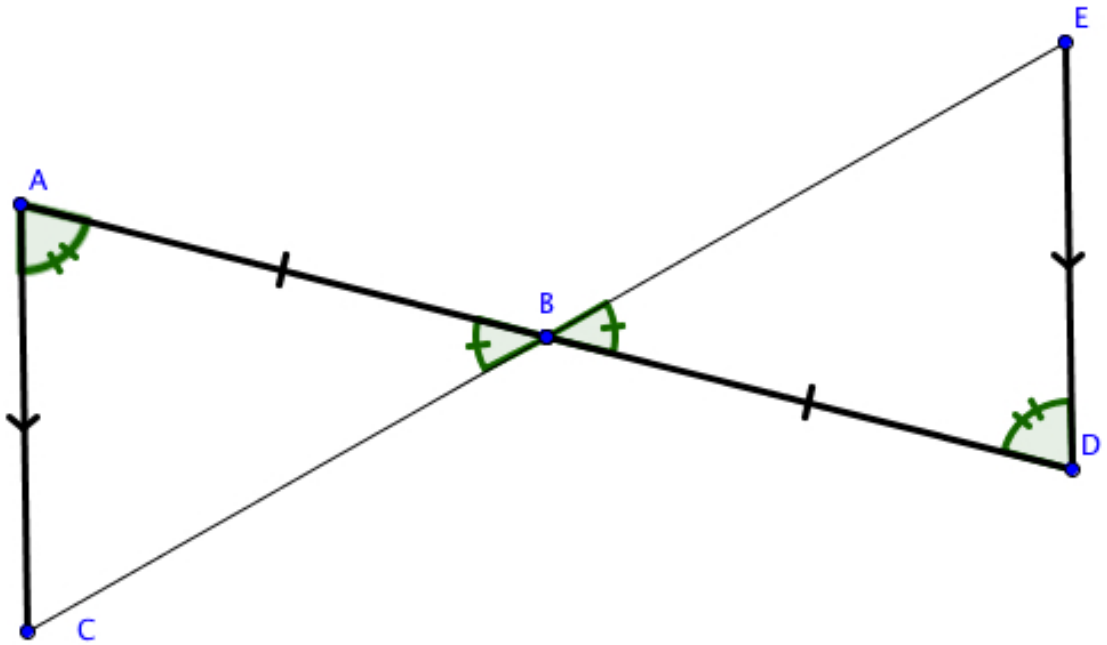
Area = 15.5 sq units

Proving Triangles Congruent

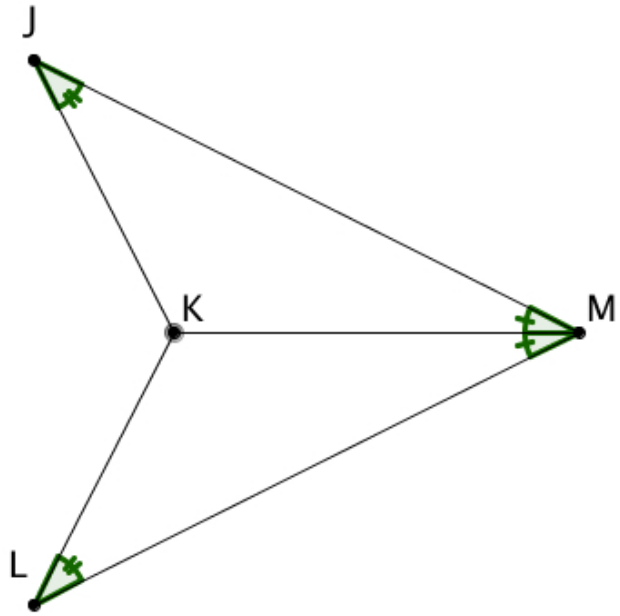


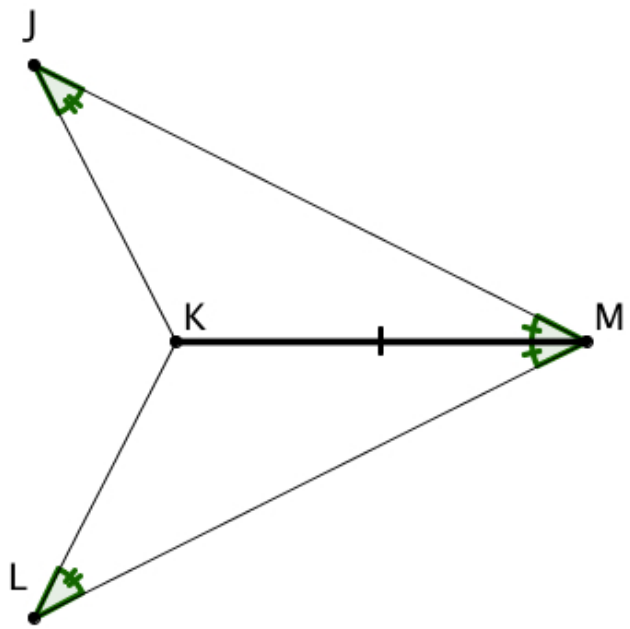
Proving Triangles Congruent



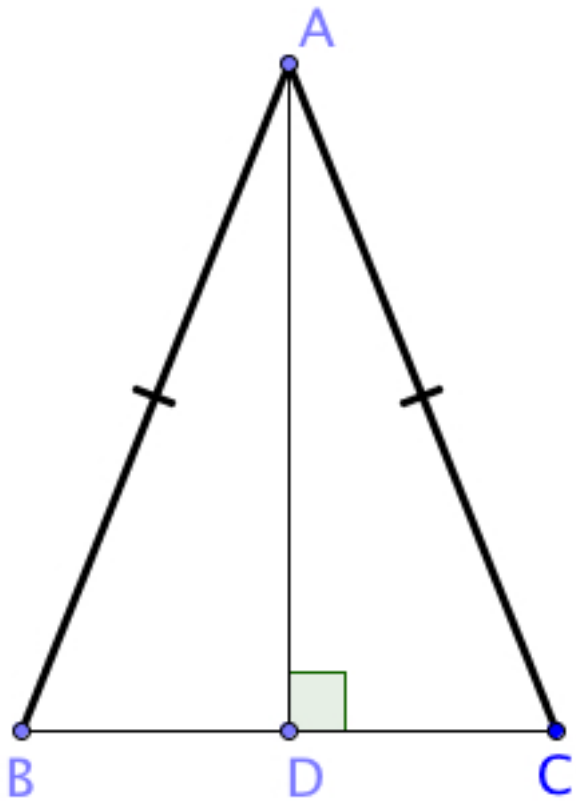


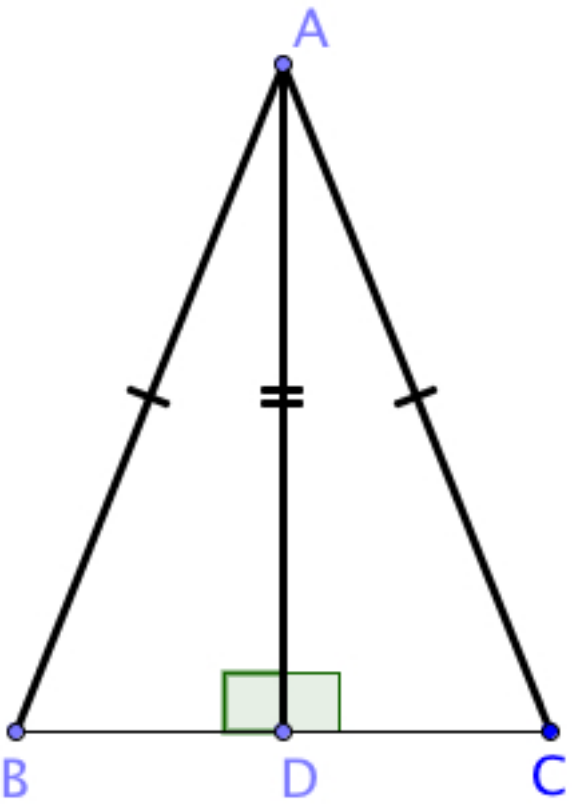
Proving Triangles Congruent



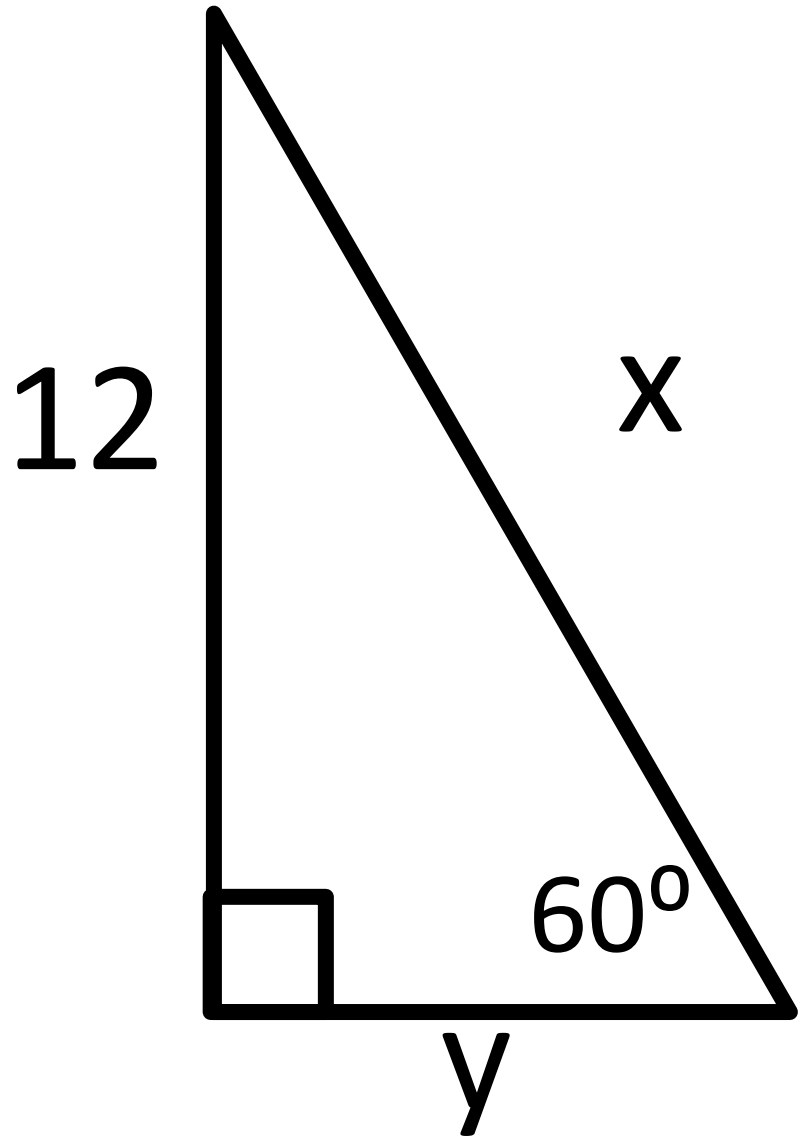


Proving Triangles Congruent





30-60-90 Triangles

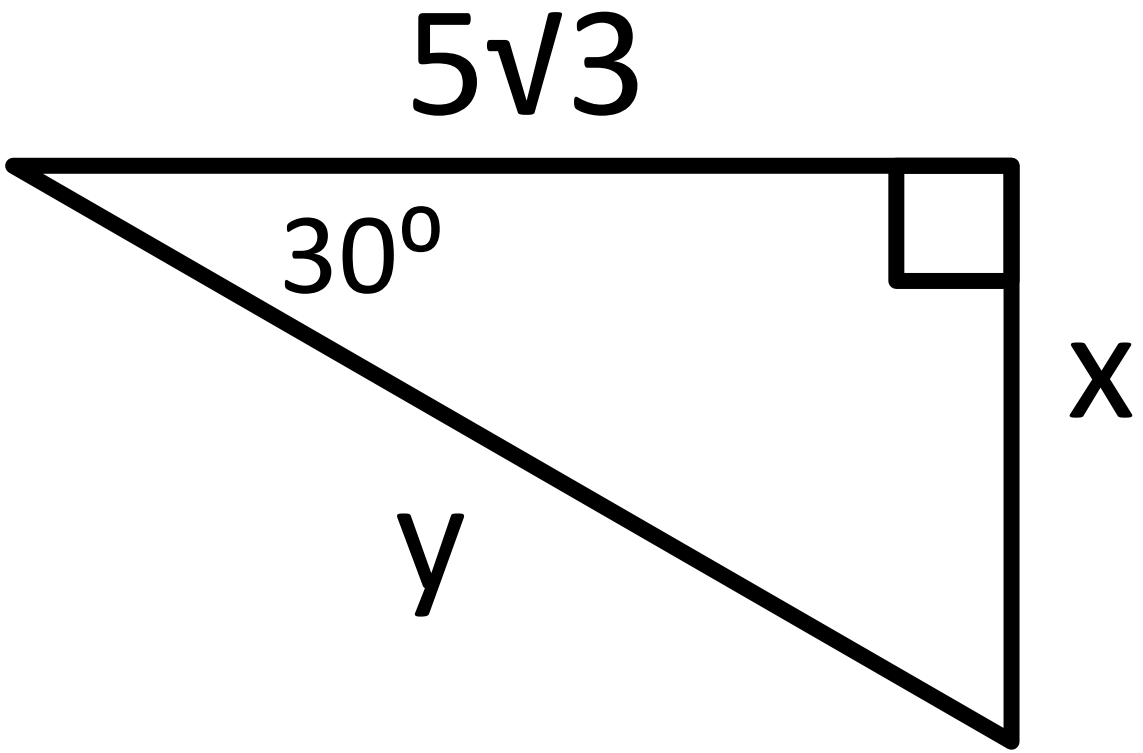


Answers:

x = 8√3

y = 4√3

30-60-90 Triangles

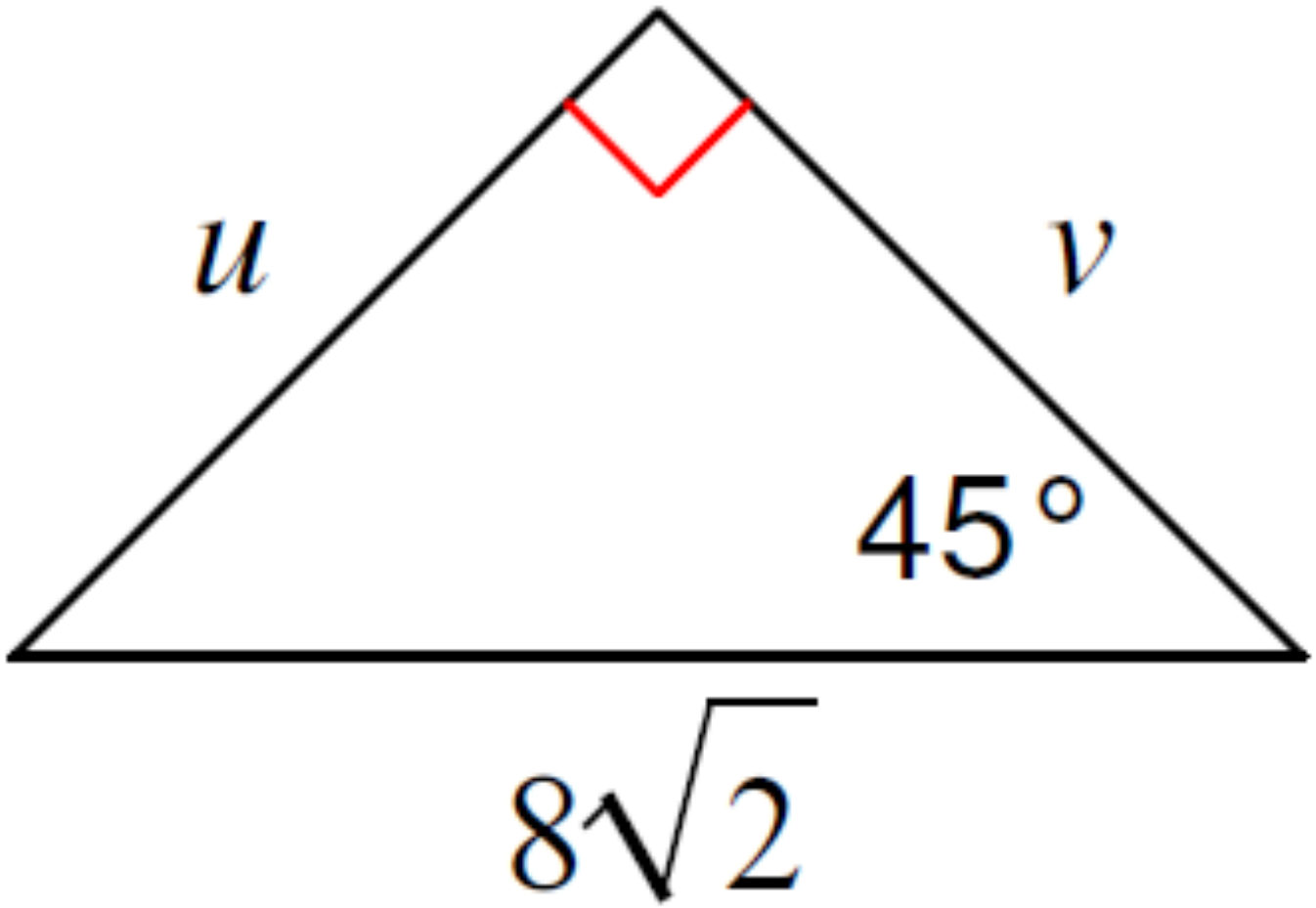


Answers:

x = 5

y = 10

45-45-90 Triangles



GeoGebra Regression Models

Linear

Logarithmic

Polynomial

Power

Exponential

Growth

Sin

GeoGebra Grid Types

Cartesian

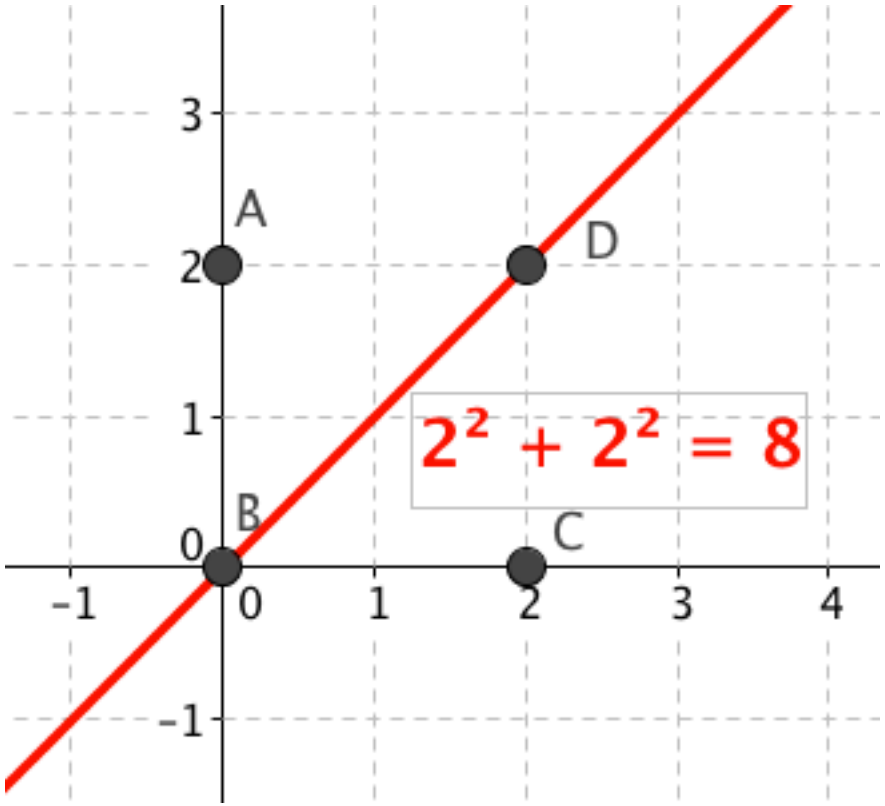
Isometric

Polar

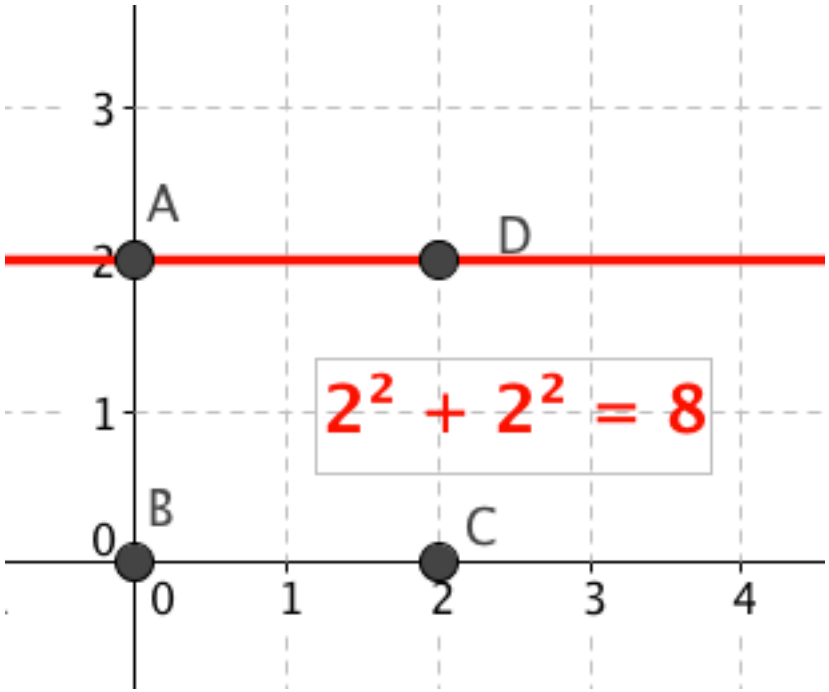
Axes

Grid

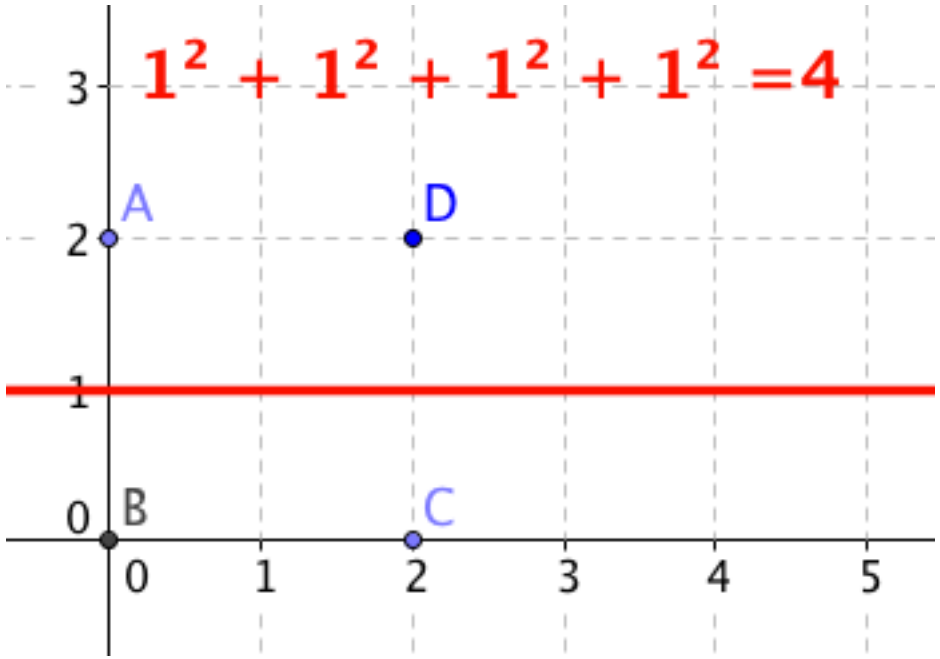
Possible Line of Best Fit



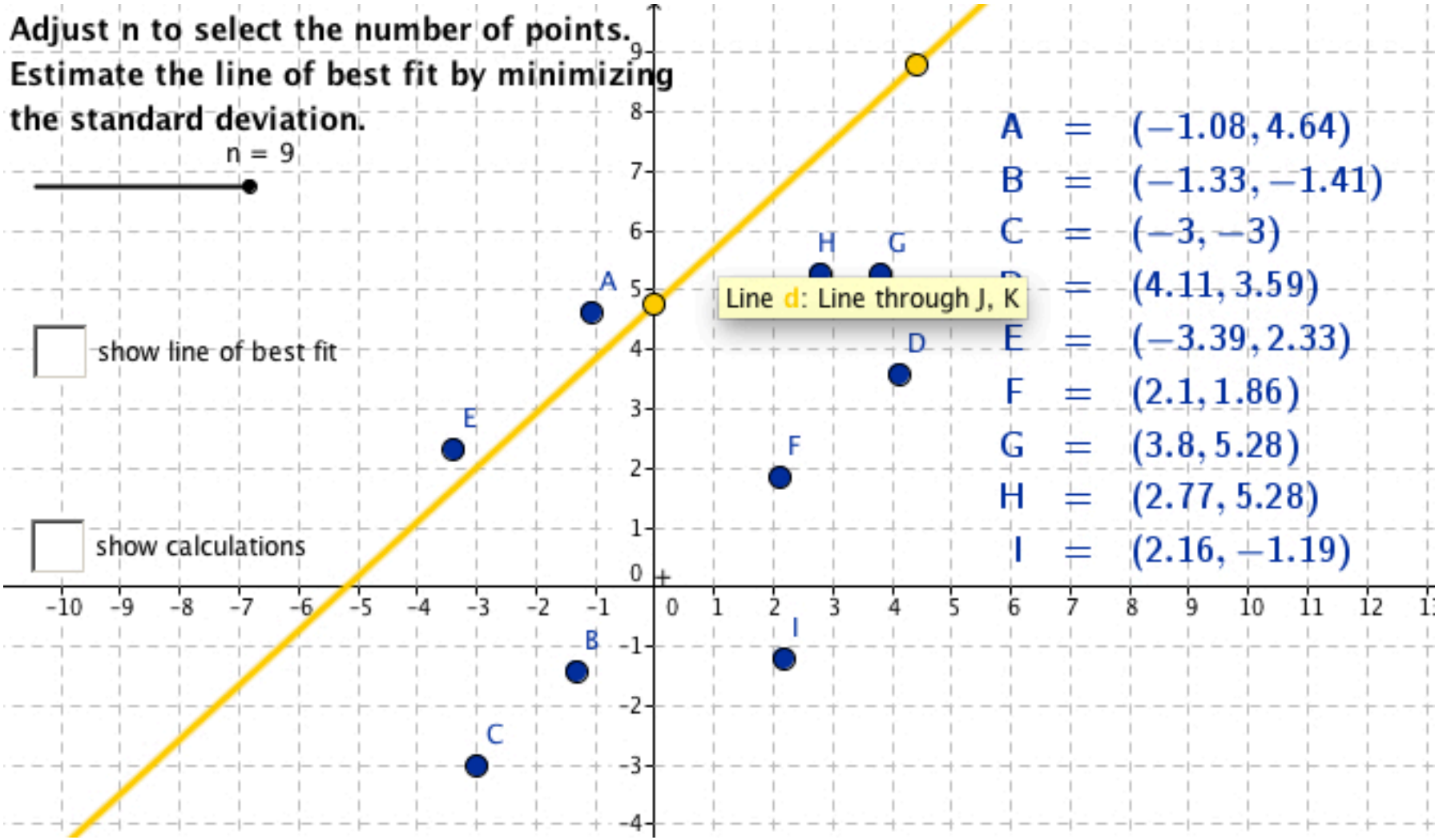
Possible Line of Best Fit



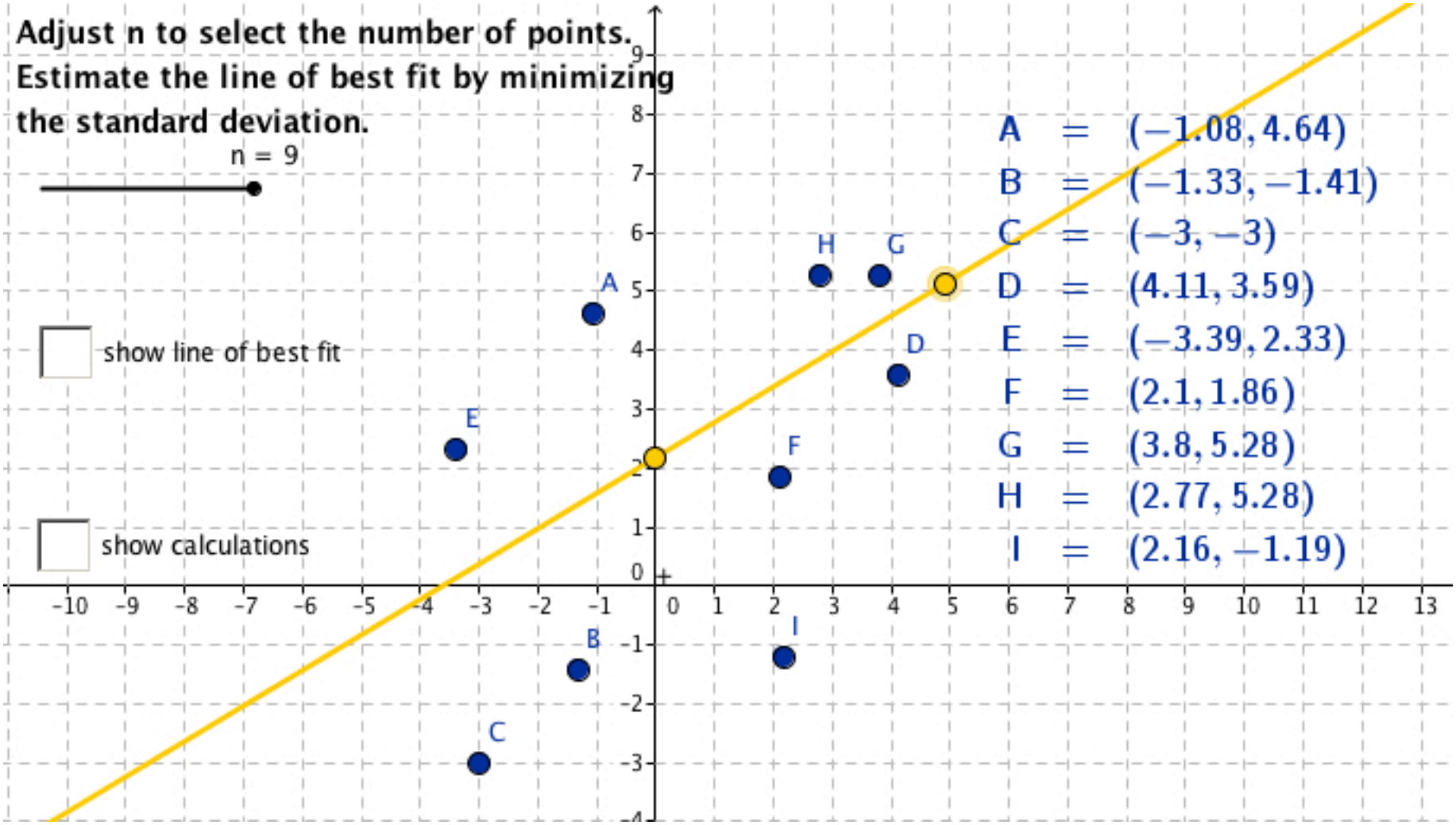
Possible Line of Best Fit

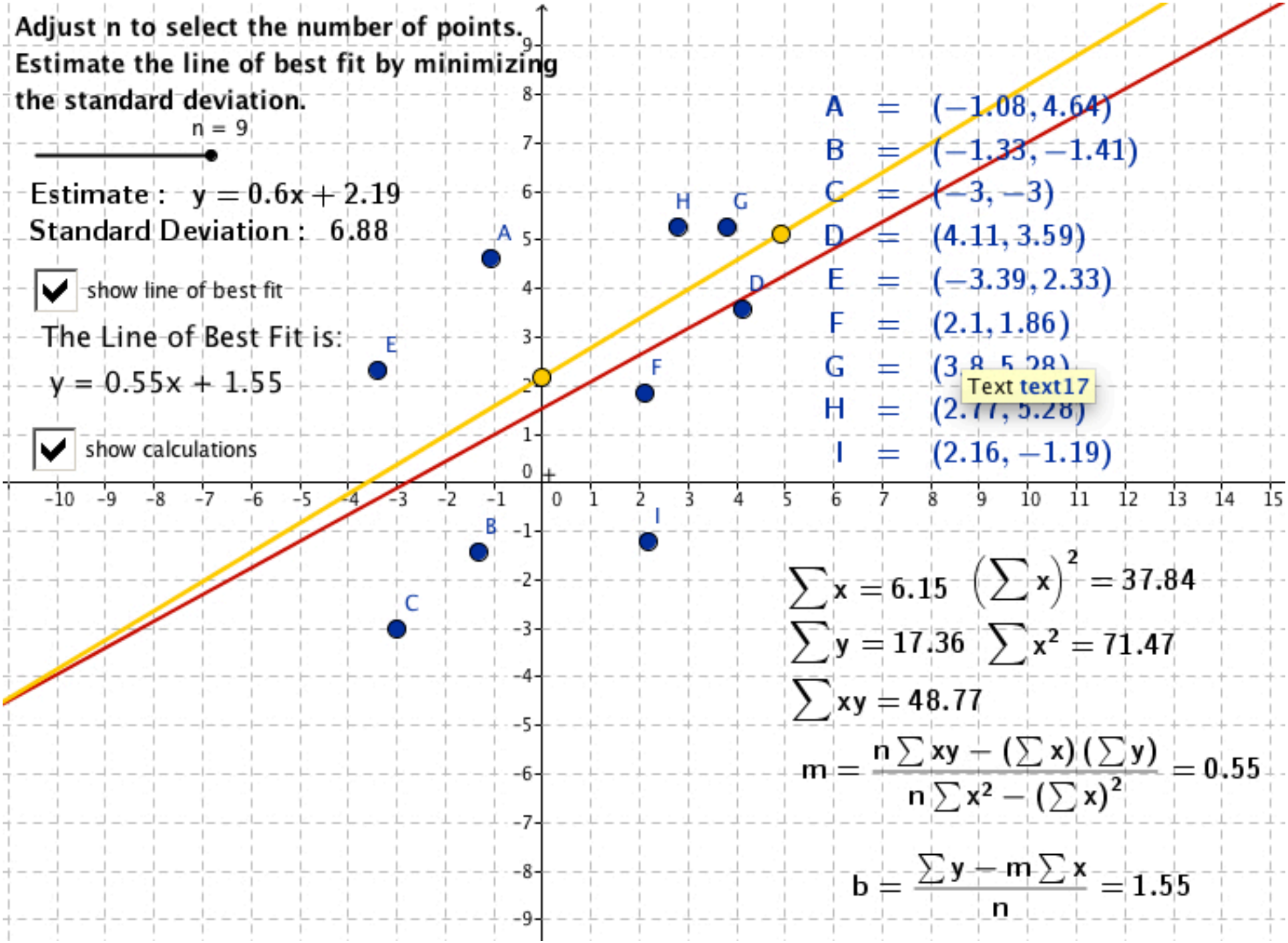


Line of Best Fit



Line of Best Fit




Adjust n to select the number of points.
Estimate the line of best fit by minimizing the standard deviation.
n = 9
Estimate : y = 0.6x + 2.19
Standard Deviation : 6.88
show line of best fit
The Line of Best Fit is:
y = 0.55x + 1.55
show calculations
A = (−1.08, 4.64)
B = (−1.33, −1.41)
C = (−3, −3)
D = (4.11, 3.59)
E = (−3.39, 2.33)
F = (2.1, 1.86)
G = (3.8, 5.28)
Text text17
H = (2.77, 5.28)
I = (2.16, −1.19)
∑x = 6.15 (∑x)² = 37.84
∑y = 17.36 ∑x² = 71.47
∑xy = 48.77
m = (n∑xy − (∑x)(∑y)) / (n∑x² − (∑x)²) = 0.55
b = (∑y − m∑x) / n = 1.55

Spreadsheet - Graphing Rational Fcn – Asymptote

Math Forum POW – Thursday Session #34
Max Ray-Riek

The first four terms of a pattern are shown below:

ABBA
AABBBAA
AAABBBBAAA
AAAABBBBBAAAA
…
Can you find a term in the pattern that has exactly one-third Bs?

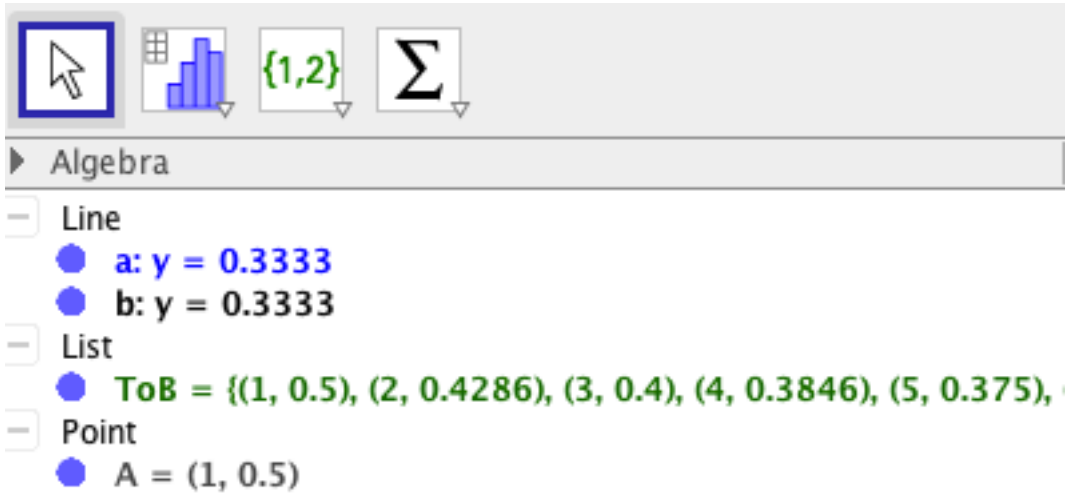
Spreadsheet - Graphing Rational Fcn – Asymptote

	A	B	C	D	E
1	n	B	A	Tot	Ratio(B:T)
2	1	2	2	4	0.5
3	2	3	4	7	0.4286
4	3	4	6	10	0.4
5	4	5	8	13	0.3846
6	5	6	10	16	0.375
7	6	7	12	19	0.3684
8	7	8	14	22	0.3636
9	8	9	16	25	0.36
10	9	10	18	28	0.3571
11	10	11	20	31	0.3548
12	11	12	22	34	0.3529
13	12	13	24	37	0.3514
14	13	14	26	40	0.35
15	14	15	28	43	0.3488
16	15	16	30	46	0.3478
17	16	17	32	49	0.3469
18	17	18	34	52	0.3462
19	18	19	36	55	0.3455
20	19	20	38	58	0.3448
21	20	21	40	61	0.3443
22	21	22	42	64	0.3438
23	22	23	44	67	0.3433
24	23	24	46	70	0.3429
25	24	25	48	73	0.3425

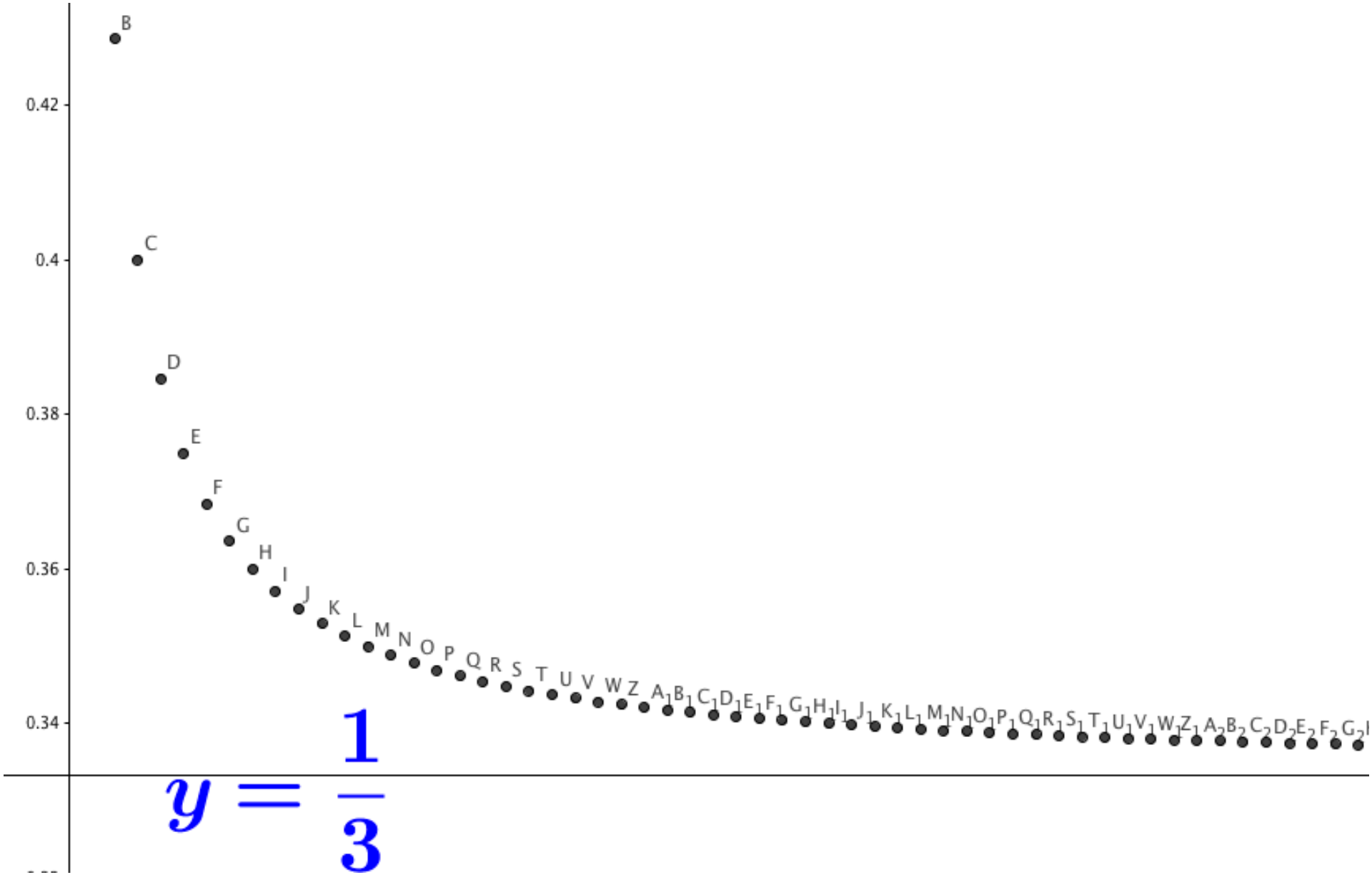
Spreadsheet - Graphing Rational Fcn – Asymptote

	A	B	C	D	E	F	G
1	n	B	A	Tot	Ratio(B:T)	n	Ratio(B:T)
2	1	2	2	4	0.5	1	0.5
3	2	3	4	7	0.4286	2	0.4286
4	3	4	6	10	0.4	3	0.4
5	4	5	8	13	0.3846	4	0.3846
6	5	6	10	16	0.375	5	0.375
7	6	7	12	19	0.3684	6	0.3684
8	7	8	14	22	0.3636	7	0.3636
9	8	9	16	25	0.36	8	0.36
10	9	10	18	28	0.3571	9	0.3571
11	10	11	20	31	0.3548	10	0.3548
12	11	12	22	34	0.3529	11	0.3529
13	12	13	24	37	0.3514	12	0.3514
14	13	14	26	40	0.35	13	0.35
15	14	15	28	43	0.3488	14	0.3488
16	15	16	30	46	0.3478	15	0.3478
17	16	17	32	49	0.3469	16	0.3469
18	17	18	34	52	0.3462	17	0.3462
19	18	19	36	55	0.3455	18	0.3455
20	19	20	38	58	0.3448	19	0.3448
21	20	21	40	61	0.3443	20	0.3443
22	21	22	42	64	0.3438	21	0.3438
23	22	23	44	67	0.3433	22	0.3433
24	23	24	46	70	0.3429	23	0.3429
25	24	25	48	73	0.3425	24	0.3425

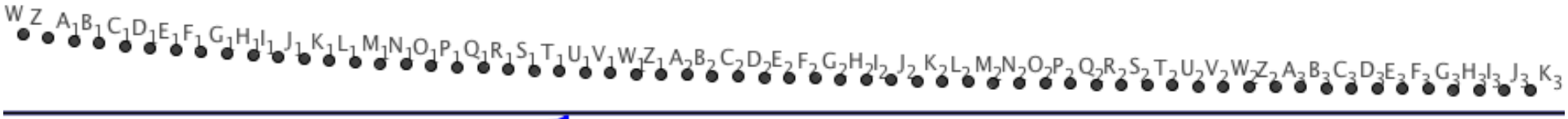
Spreadsheet - Graphing Rational Fcn – Asymptote



Spreadsheet - Graphing Rational Fcn – Asymptote



Spreadsheet - Graphing Rational Fcn – Asymptote



$$y = \frac{1}{3}$$

Curve Fitting – Nebraska Temperatures

	A	B
1	http://...	
2	North	Platte
3	Month	Ave
4	1	21.6
5	2	27.6
6	3	36.5
7	4	48.2
8	5	58.2
9	6	67.9
10	7	74
11	8	71.8
12	9	61.4
13	10	49.7
14	11	35.4
15	12	24.2

Curve Fitting – Nebraska Temperatures