	A	B	C
=			
1	side_1	7	
2	side_2	16	
3	side_3	17	
4			
5			
6			
7			
8			
9			
10			
11			

A1 side_1

Given information: SSS

side_1 = 7

side_2 = 16

side_3 = 17

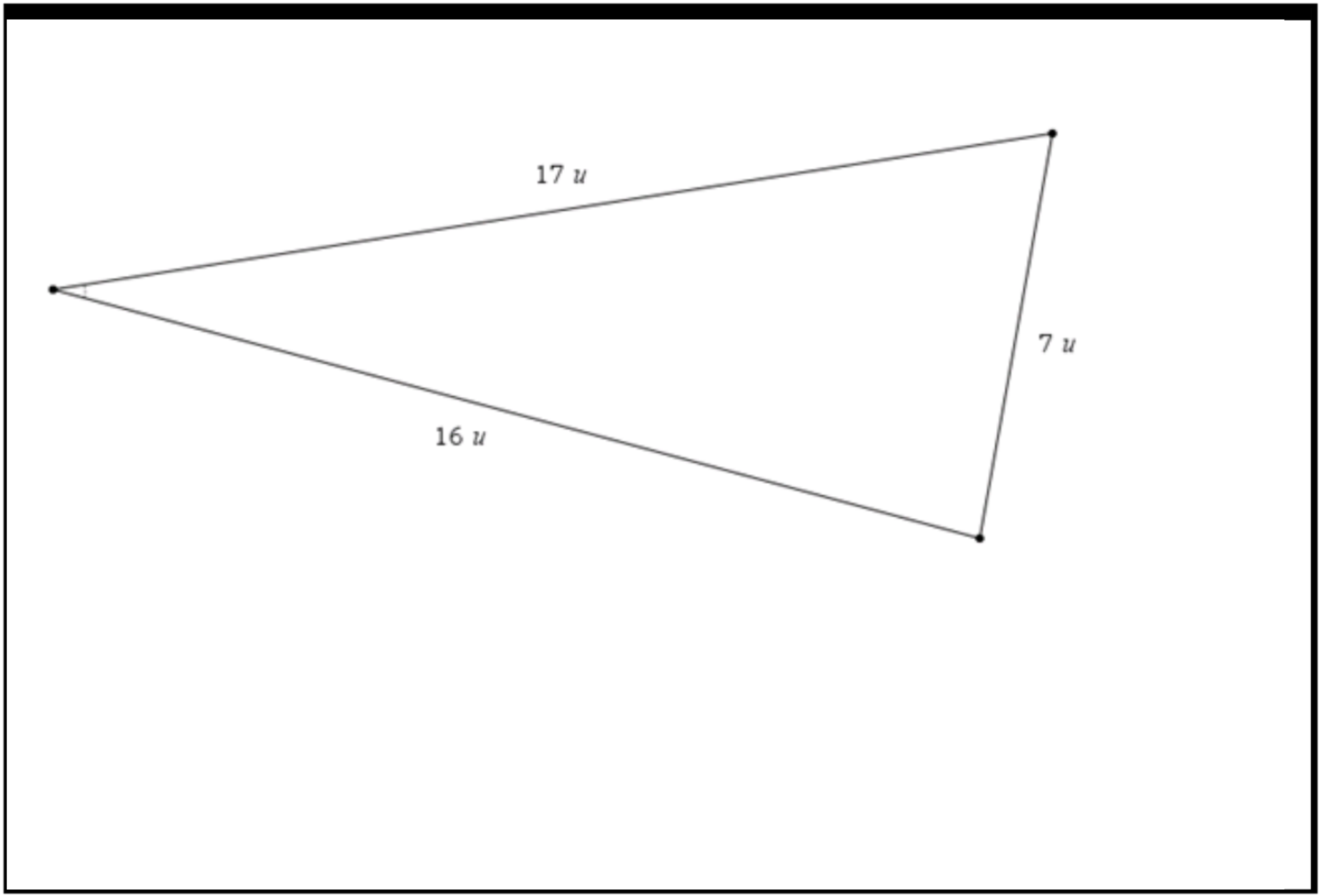
semiperimeter = 20

$A = \sqrt{[(20.\,(20.-7)(20.-16)(20.-17)]}$

$= \sqrt{[3120.\,]}$

≈ 55.857

$P = 7+16+17 \approx 40$


17 u
7 u
16 u

	A	B
=		
1	side_1	7
2	side_2	13
3	angle_3	28
4		
5		
6		
7		
8		
9		
10	63.8908	
11		

A1 side_1

Given information: SAS

side_1 = 7

side_2 = 13

included angle =28 missing side (see below)

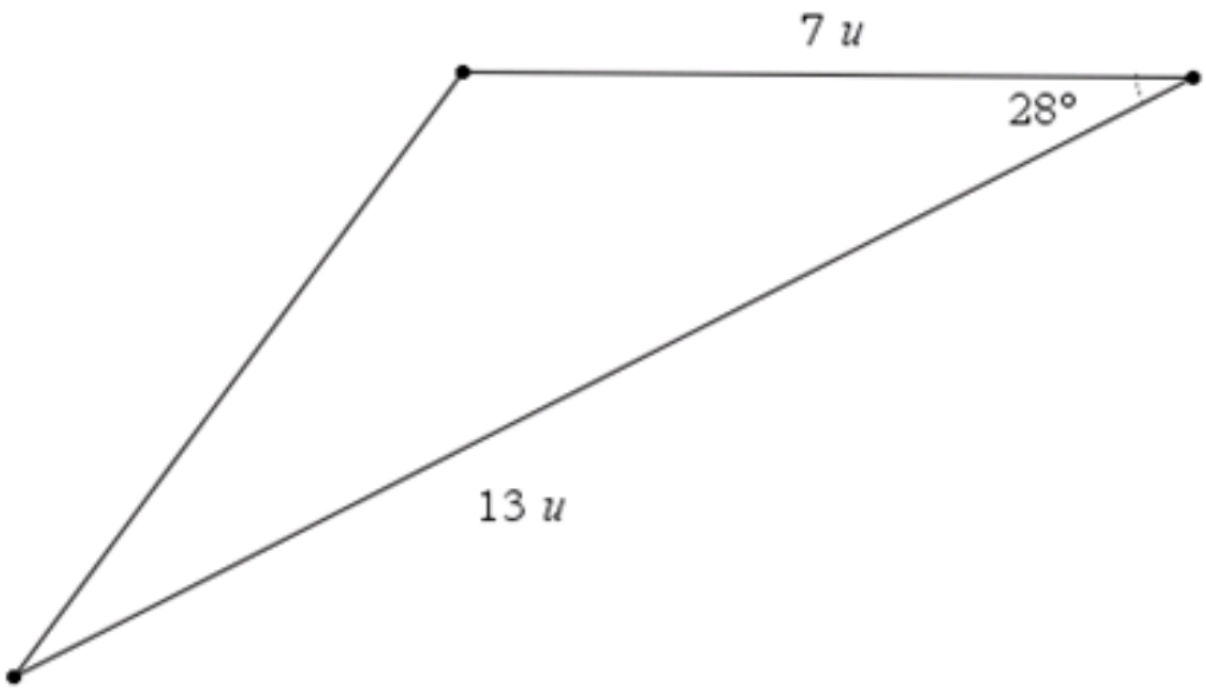
$A = \frac{1}{2}(7)(13)\sin(28) \approx 21.361$

$P = 7 + 13 + 7.56991 \approx 27.5699$

$side\ 3 = \sqrt{(7)^2 + (13)^2 - 2(7)(13)\cos(28)}$

$\sqrt{218 - 182\cos(28)}$

7.56991


7 u
28°
13 u

5) bearing of 289

5a) 341 ° South of West

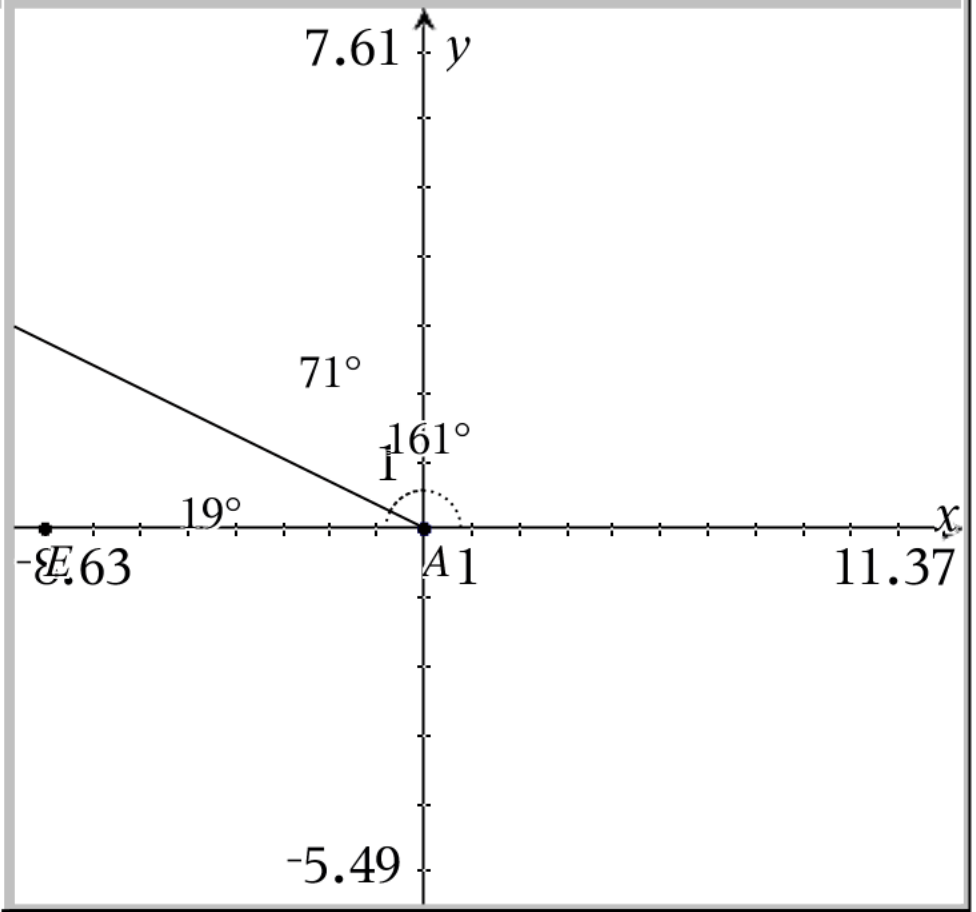
360 −19

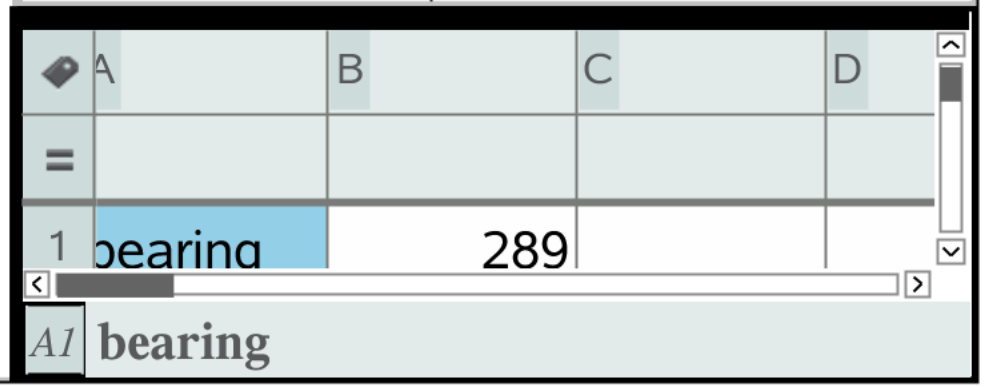
5b) 19 ° North of West

289 −270

5c) S 109 ° W

90+19





7) 17 ° **West of South**

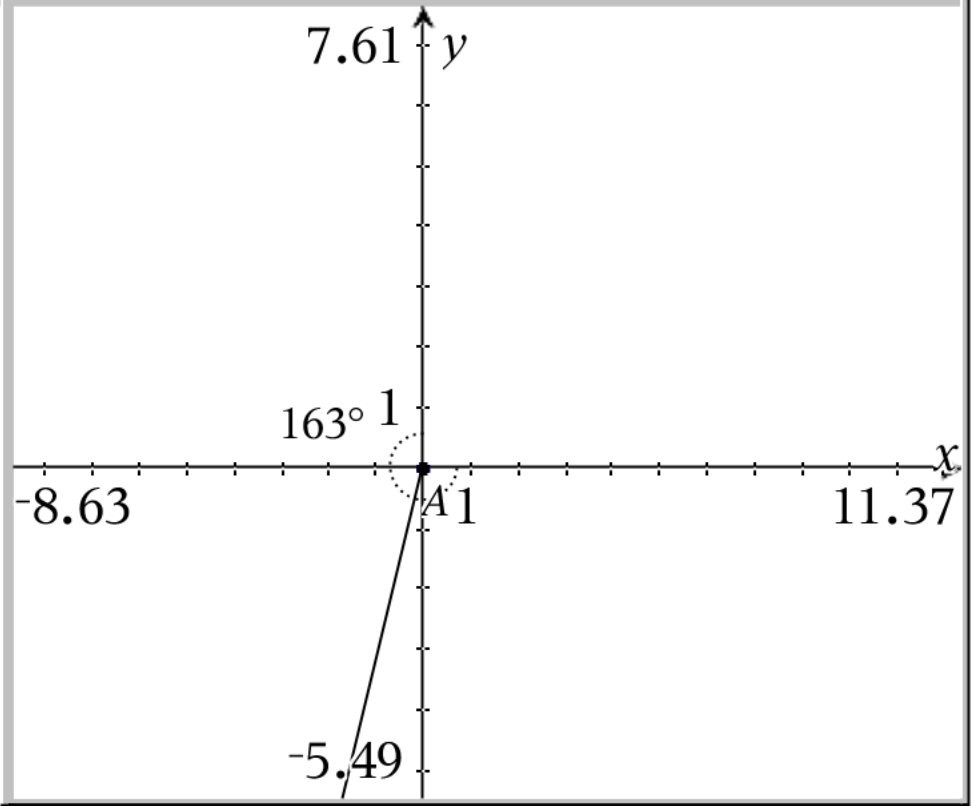
7a) bearing of °

197 °

7b) ° East of North

197 °

7c) N 163 ° **W**

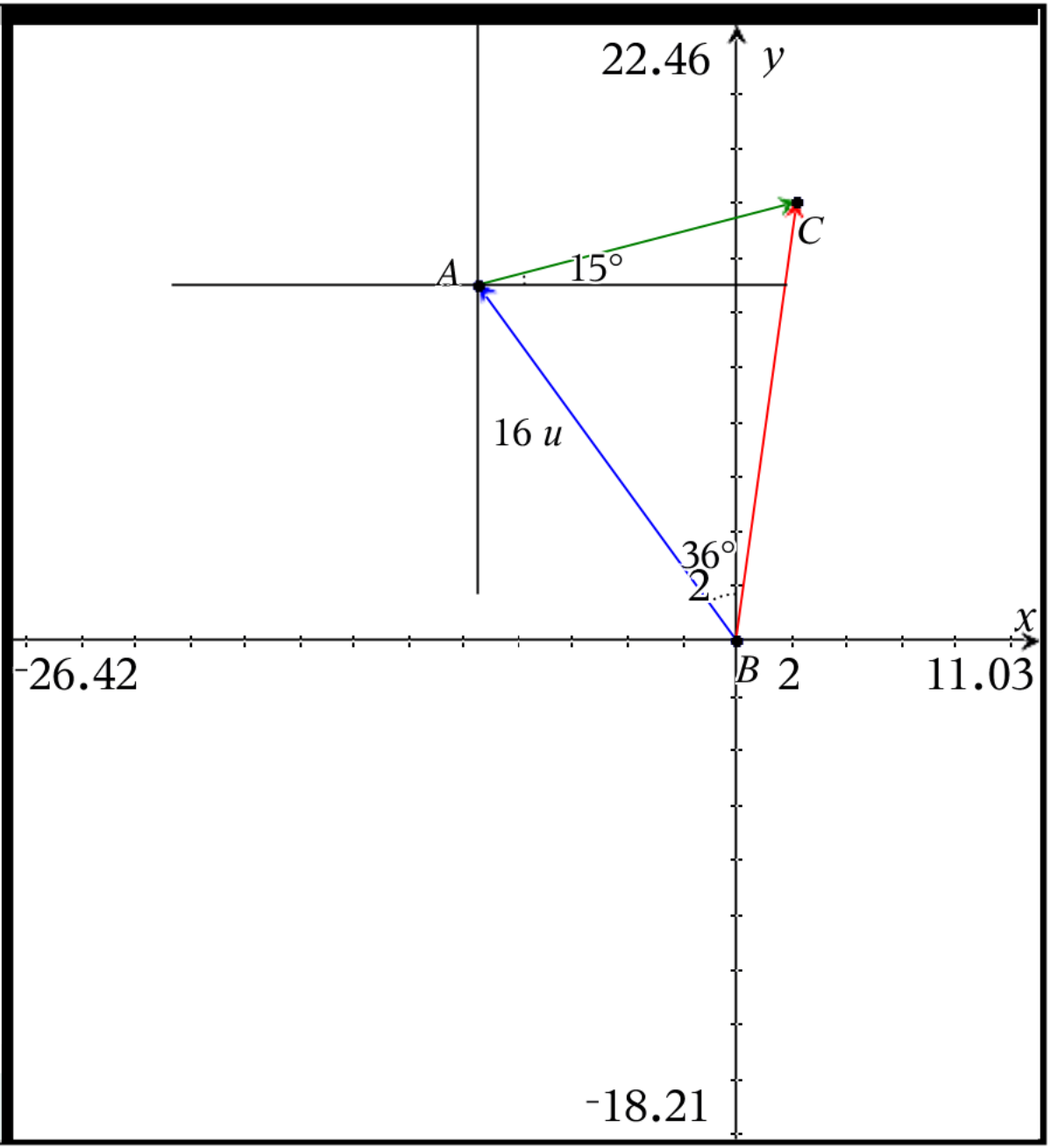


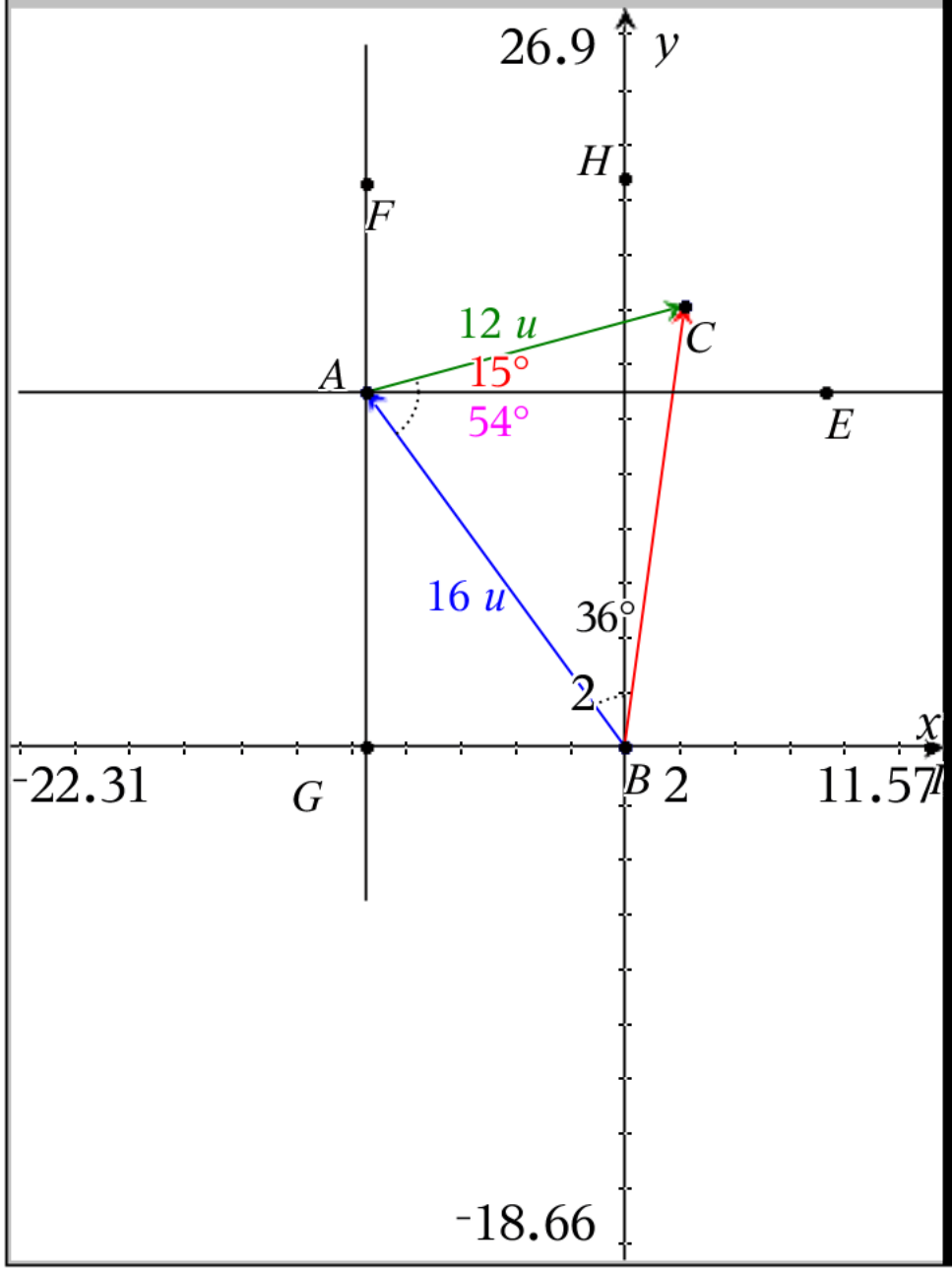
	A	B	C	D
=				
1	given_a...	17		
2				

A1 given_angle

	A	B	C
=			
1	angle_1	36	
2	magn_1	16	
3	angle_2	105	
4	magn_2	12	
5			
6			
7			
8			
9			
10			
11			

A1 angle_1





Note m∠GAC =105 ° from given

We can find that m∠EAC =15 °

105 −90

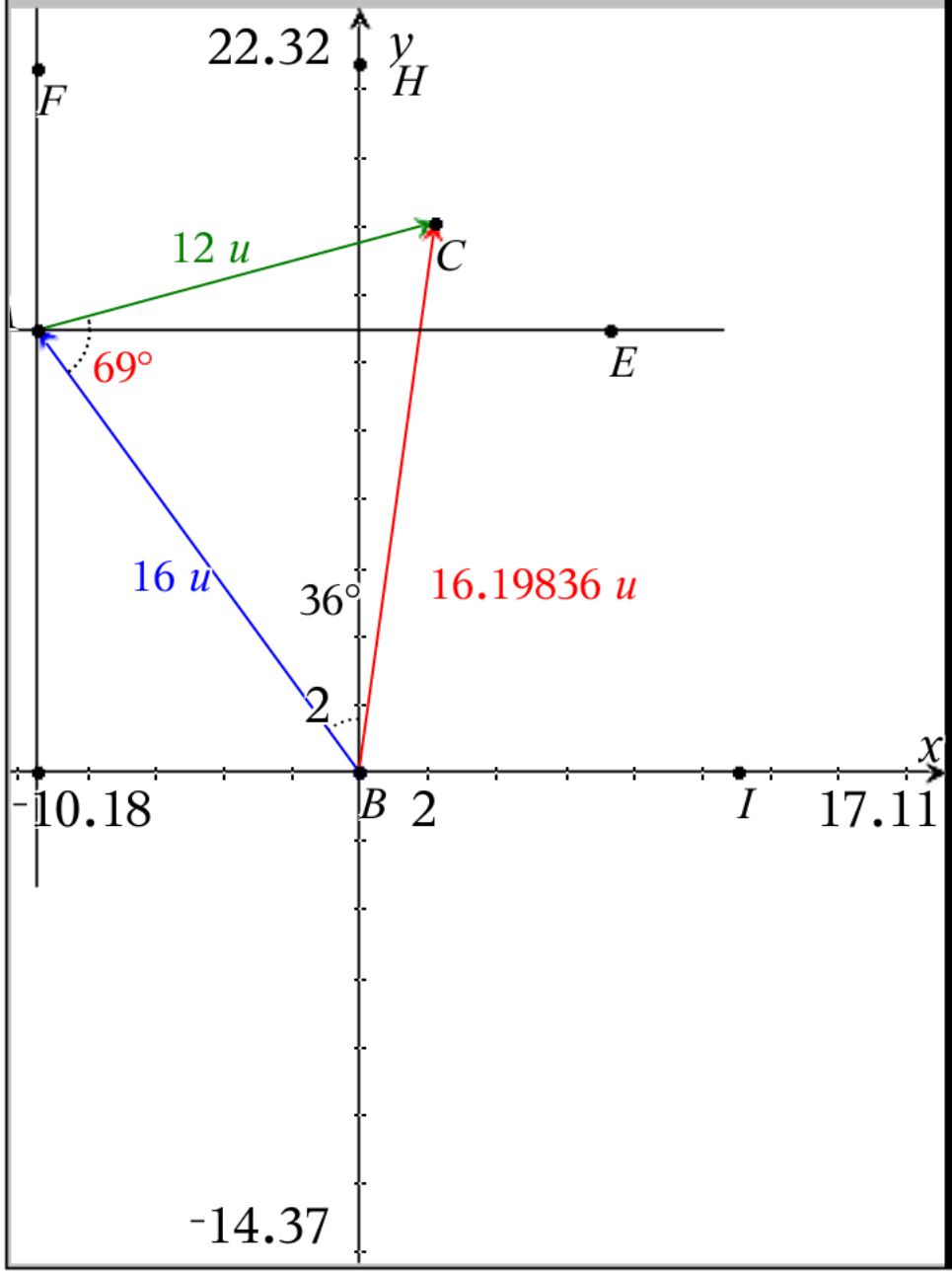
Note: m∠HBA =36 ° from given

We can find m∠BAE =54 °

90 −36

We can now find m∠BAC =69 °

15 +54

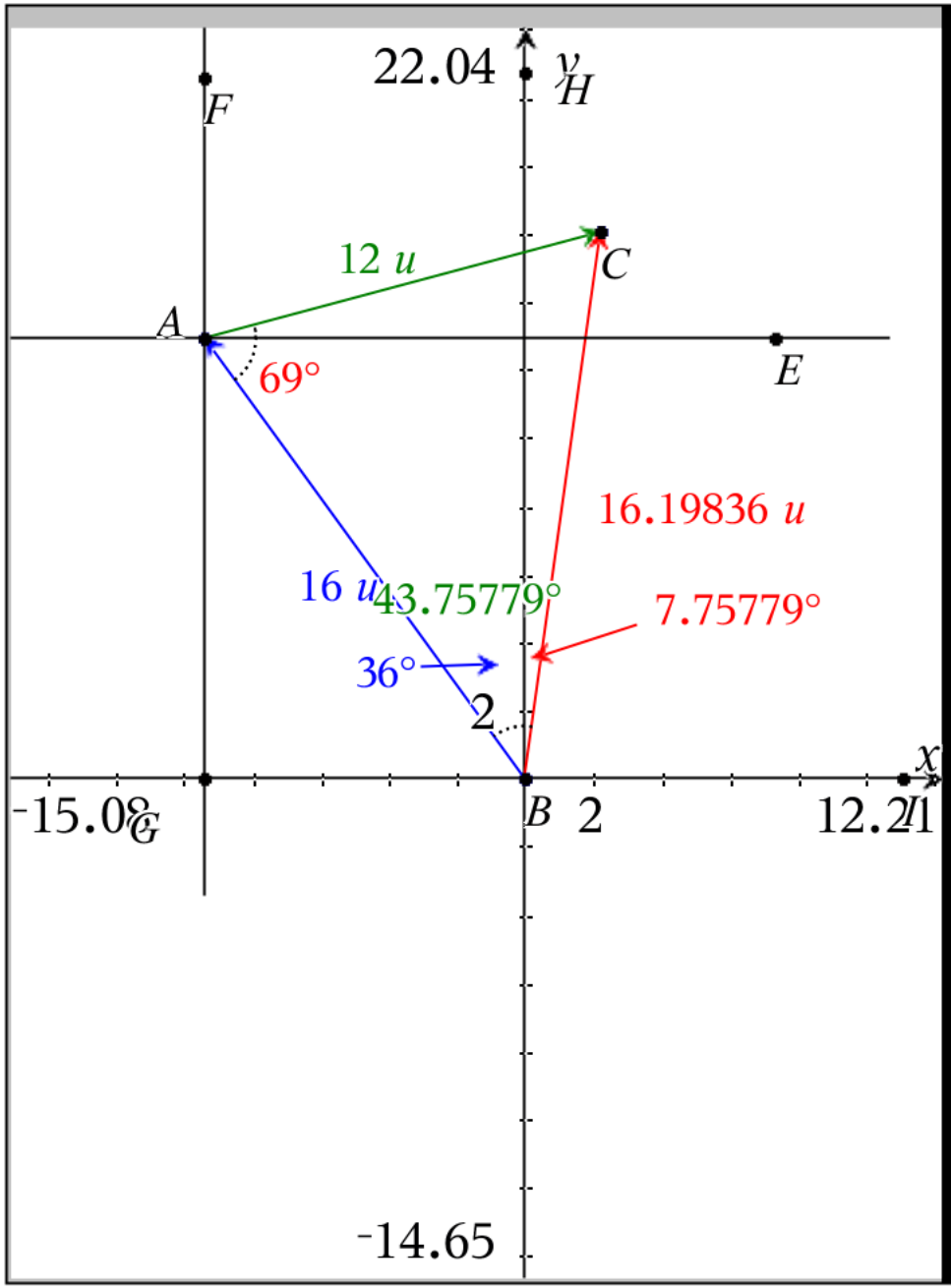


now that we know the angle opposite of the BC we can find its distance using law of cosines

$BC = \sqrt{[16^2 + 12^2 - 2(16)(12)\cos(69)]}$

$BC = \sqrt{[400 - 384)\cos(69)]}$

$BC = 16.1984$



Now have enough information to find

m∠ABC which leads us to direction from Bob's House to Cindy's House

cos ABC =

$(16^2+16.1984^2-12^2)/[2(16)(16.1984)]$

$=0.72227$

$m\angle ABC=43.7578$

This can be used to find

$m\angle HBC=43.7578-36=7.75779°$

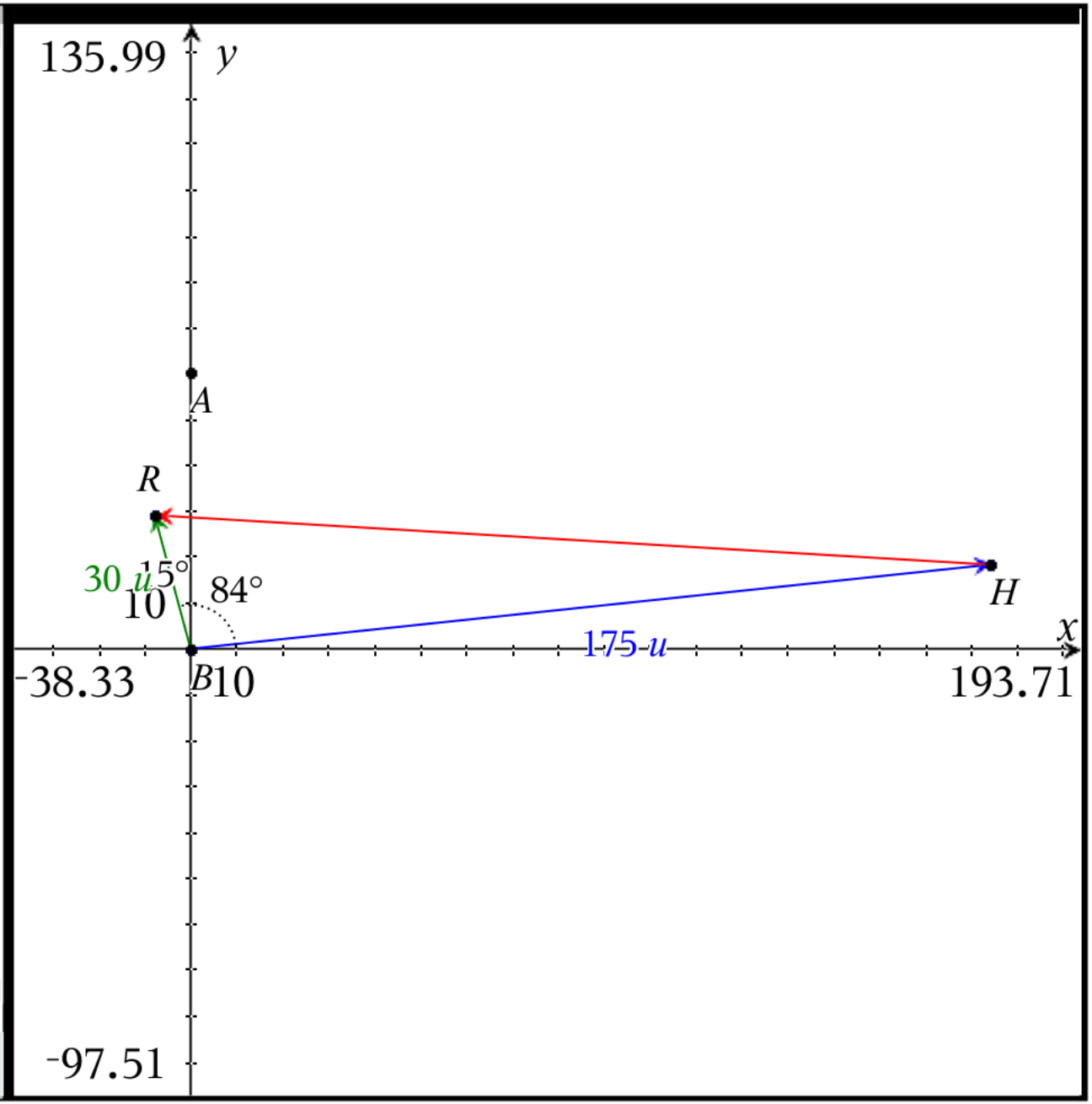
This is BEARING which leads to many other forms of direction or heading

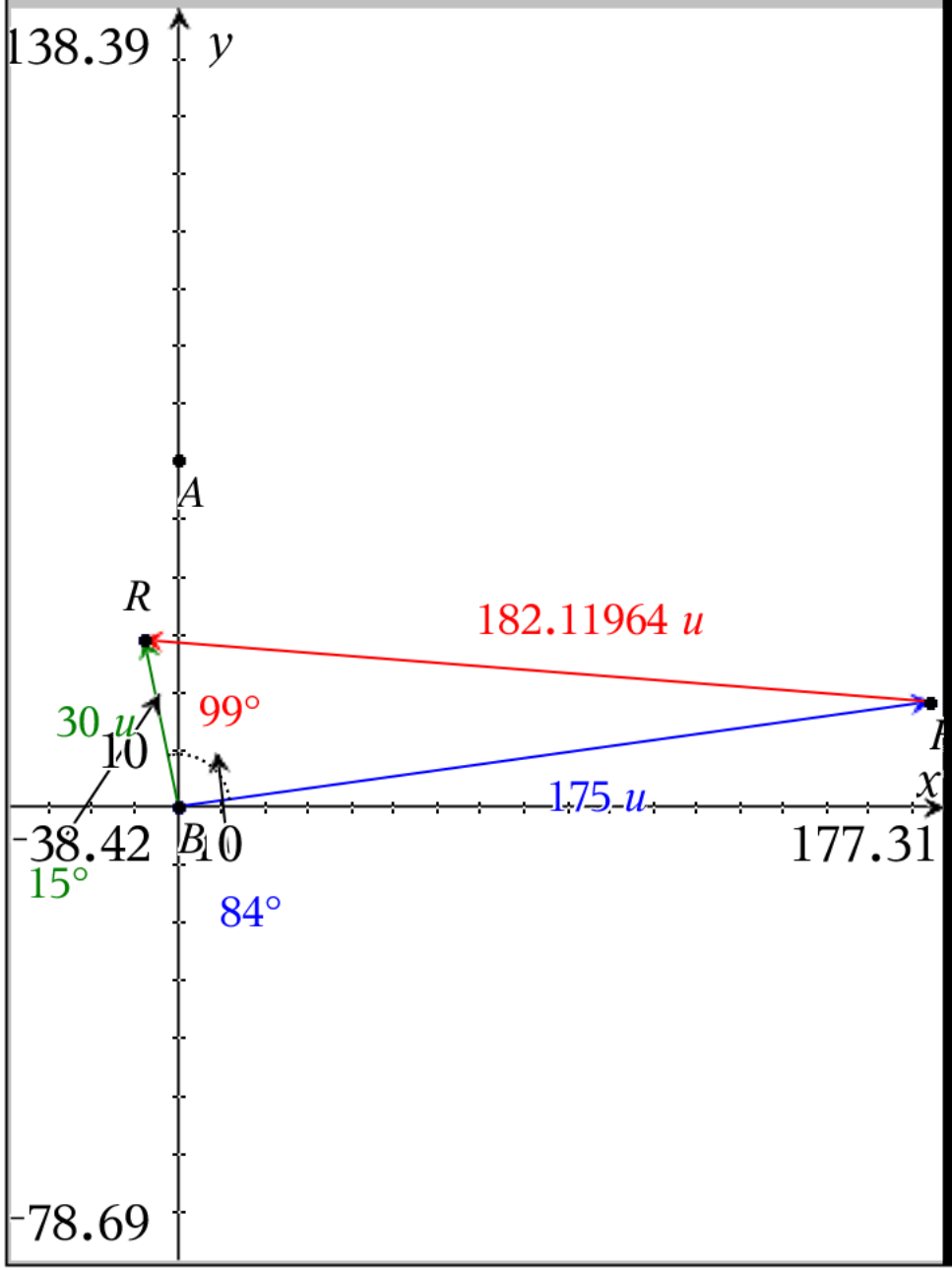
82.2422 ° North of East

$\arcsin\left(\frac{21\cdot\sin(62.)}{19.532}\right)\blacktriangleright 71.6787$

	A	B	C
=			
1	bearing	84	
2	rate_1	35	
3	angle_1	15	
4	rate_2	6	
5	time	5	
6			
7			
8			
9			
10			
11			

A1 bearing





Why is BH 175 ?

BH $=35(5)=175$

Why is BR 30 ?

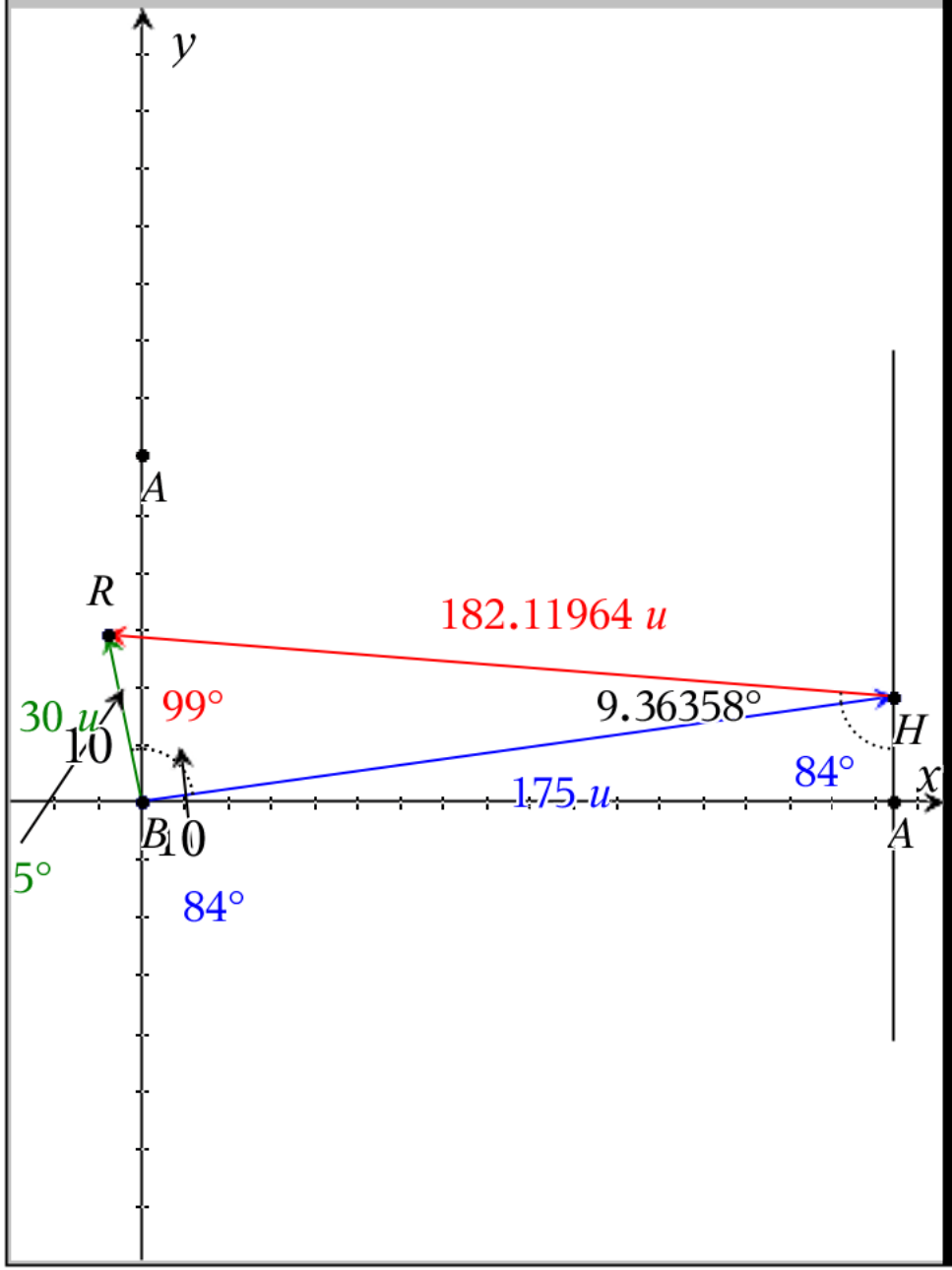
BR $=6(5)=30$

Since we were given the angles that actually form angle RBH it is a relatively easy task to find RH

RH $=\sqrt{[175^2+30^2-2(175)(30)\cos(99)]}$

RH $=\sqrt{[31525-10500)\cos(99)]}$

RH $=182.12$



To describe the direction of of vector HR we need m∠RHB, since we now know all three sides, I would use law of cosines

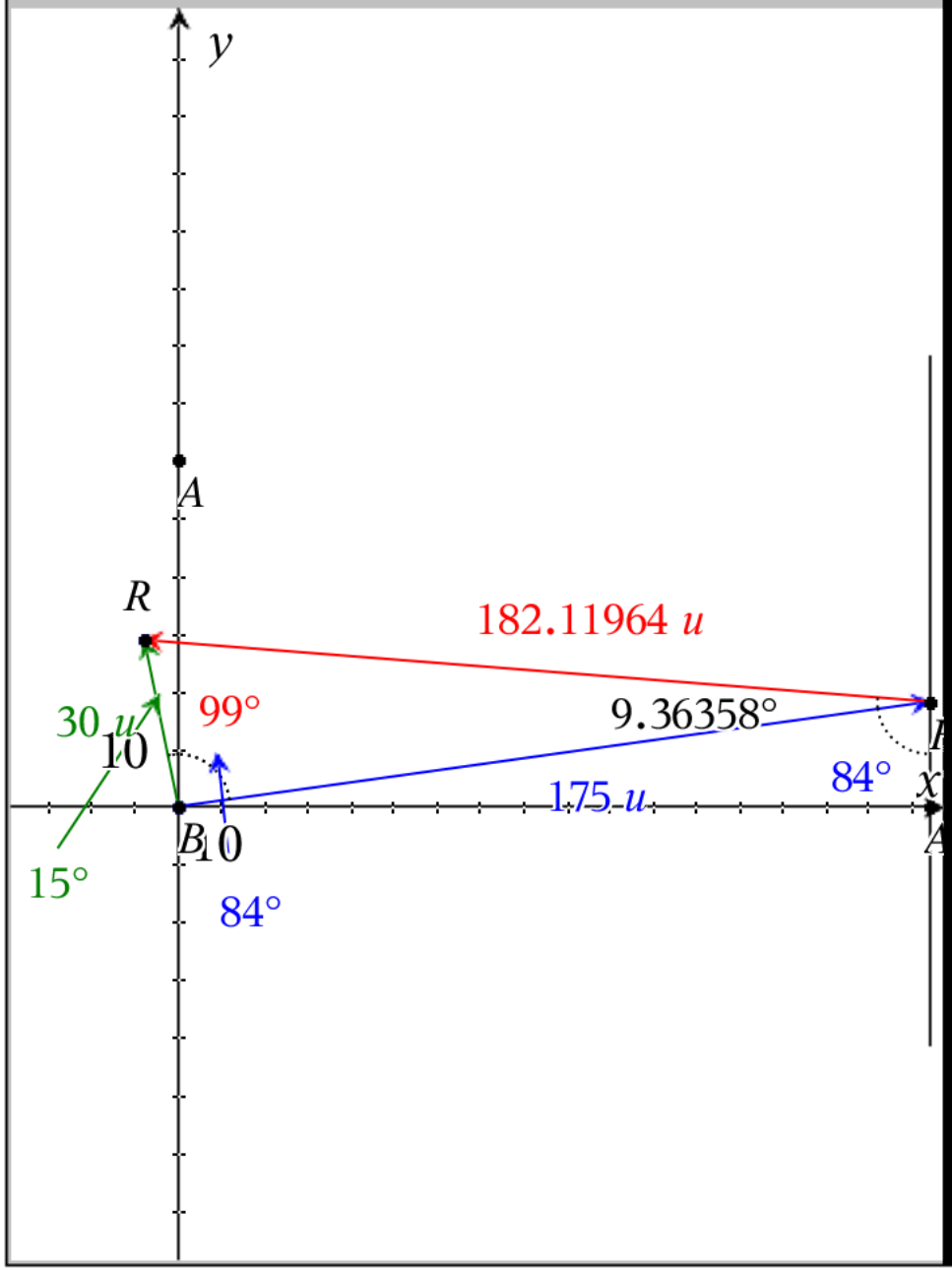
to find m∠RHB

$\cos \text{RHB} =$

$(175^2+182.12^2-30^{2)})/[2(175)(182.12)]$

$=0.986676$

$m\angle RHB=9.36358$



Now that we know m∠RHB we can find

m∠RHA=m∠AHB+m∠RHB

=84 +9.36358

=93.3636 °

This is the direction S 93.3636 ° W

Which means the bearing is 273.364 °

You can also state the direction is

N 86.6364 °W

You can also state the direction is

-3.36358 ° South of West

You can also state the direction is

183.364 °South of East

$$CB = \sqrt{(35\cdot x)^2+(6\cdot x)^2-2\cdot 35\cdot x\cdot 6\cdot x\cdot \cos\ (99)}$$

$$(35\cdot x)^2+(6\cdot x)^2 \blacktriangleright 1261\cdot x^2$$

$$-2\cdot 35\cdot x\cdot 6\cdot x \blacktriangleright -420\cdot x^2$$

$$CB = \sqrt{1261\cdot x^2-420\cdot x^2\cdot \cos(99)}$$

$$100^2 = 1261\cdot x^2-420\cdot x^2\cdot \cos(99)$$

$$100^2 = 1261\cdot x^2-420\cdot x^2\cdot \cos(99)$$

$$\frac{10000}{1261-420\cdot \cos(99)} = \frac{x^2 1261-420\cdot \cos(99)}{(1261-420\cdot \cos(99))}$$

$$x^2 = \frac{10000}{1261-420\cdot \cos(99.)} \blacktriangleright 7.53748$$

$$x = \sqrt{\frac{10000}{1261-420\cdot \cos(99.)}} \blacktriangleright 2.74545$$

$$CB = \sqrt{\left(35\cdot \sqrt{\frac{10000}{1261-420\cdot \cos\ (99.)}}\right)^2+\left(6\cdot \sqrt{\frac{10000}{1261-420\cdot \cos\ (99.)}}\right)^2-2\cdot 35\cdot \sqrt{\frac{10000}{1261-420\cdot \cos\ (99.)}}\cdot 6\cdot \sqrt{\frac{10000}{1261-420\cdot \cos\ (99.)}}\cdot \cos(99)} \blacktriangleright 100.$$

$$CB = \sqrt{(35\cdot 2.745)^2+(6\cdot 2.745)^2-2\cdot 35\cdot 2.745\cdot 6\cdot 2.745\cdot \cos(99)} \blacktriangleright 99.9837$$