Found Math 110

Ambiguous Case (Sine Law)

1.

Determine how many triangles satisfy the following conditions.

a) $\angle A = 65°$, $a = 4.0$ cm, and $b = 4.4$ cm

Sketch a possible diagram. Place the known $\angle A$ at the lower left corner of your diagram.

$h = b \sin A$

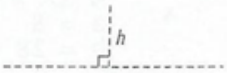
$h =$

$\angle A$ is acute and $a < b$, so calculate the altitude.

Since $a = h$, there is/are _____ triangle(s).
(*zero, one,* or *two*)

$\angle B$ is a(n) _____ angle.
(*acute, obtuse,* or *right*)

b) $\angle A = 20°$, $a = 6$, and $b = 25$



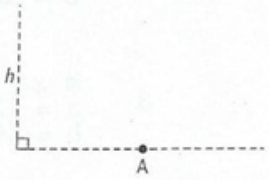
$h = b \sin A$

$h =$

Compare the length of side *a* to the altitude.

Since $a < h$, there is/are _____ triangle(s).
(*zero, one,* or *two*)

c) $\angle A = 116°$, $a = 10$ cm, and $b = 10$ cm



$\angle A$ is obtuse, so compare the lengths of *a* and *b*.

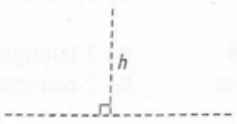
Since *a* _____ *b*, there is/are _____ triangle(s).
(< or > or =) (*zero, one,* or *two*)

d) $\angle A = 65°$, $a = 15$, and $b = 16$

When $\angle A$ is acute, compare the lengths of *a*, *b*, and *h*.

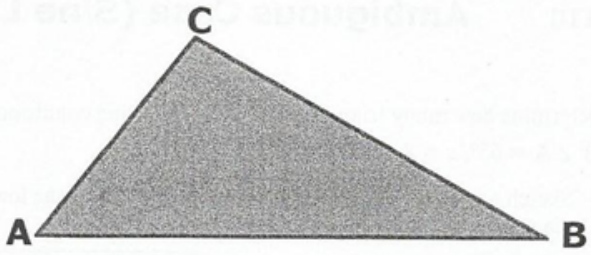
Since _____ < _____ < _____, there is/are _____ triangle(s).
(*zero, one,* or *two*)

e) $\angle A = 60°$, $a = 80$, and $b = 75$



Since $b \leq$ _____, there is/are _____ triangle(s).
(*zero, one,* or *two*)

This question should help you complete #7 on page 108 of *Pre-Calculus 11*.



2. Determine how many triangles satisfy the following conditions.

1 $m\measuredangle A = 24°$, $a = 20$, $b = 84$

2 $m\measuredangle A = 24°$, $a = 14$, $b = 12$

3 $m\measuredangle A = 96°$, $a = 20$, $b = 52$

4 $m\measuredangle A = 22°$, $a = 8$, $b = 18$

5 $m\measuredangle A = 26°$, $a = 30$, $b = 76$

6 $m\measuredangle A = 28°$, $a = 12$, $b = 10$

7 $m\measuredangle A = 64°$, $a = 32$, $b = 85$

8 $m\measuredangle A = 18°$, $a = 12$, $b = 16$

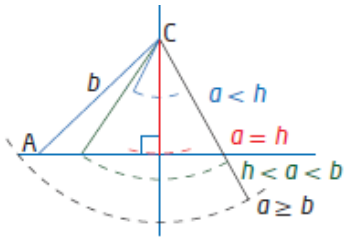
9 $m\measuredangle A = 32°$, $a = 22$, $b = 84$

10 $m\measuredangle A = 22°$, $a = 10$, $b = 28$

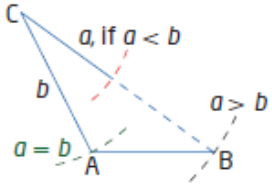
Answers

1.a) 1 triangle, right angle **b)** 0 triangles **c)** a=b, 0 triangles
d) h<a<b, 2 triangles **e)** b≤a, 1 triangle
2.1) 0 triangles **2)** 1 triangle **3)** 1 triangle **4)** 2 triangles
5) 0 triangles **6)** 1 triangle **7)** 0 triangles **8)** 2 triangles
9) 0 triangles **10)** 0 triangles

- For the ambiguous case in $\triangle ABC$, when $\angle A$ is an acute angle:
  - $a \geq b$ one solution
  - $a = h$ one solution $h = b \sin A$
  - $a < h$ no solution
  - $b \sin A < a < b$ two solutions



- For the ambiguous case in $\triangle ABC$, when $\angle A$ is an obtuse angle:
  - $a \leq b$ no solution
  - $a > b$ one solution



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