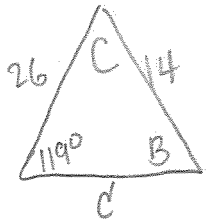
§10.1 #14 $A=119^\circ, a=14, b=26$



Soln: Find B

$$\frac{\sin(B)}{26} = \frac{\sin(119^\circ)}{14}$$

↓ m. by 26

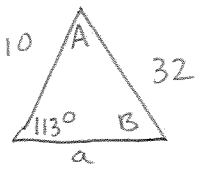
$$\sin(B) = \frac{26\sin(119^\circ)}{14}$$

↓ take arcsin (calculator in DEGREE mode)

$$B = \sin^{-1}\left(\frac{26\sin(119^\circ)}{14}\right) \approx \text{ERROR!!}$$

So this "Δ" does not exist!!

#15 $C=113^\circ, b=10, c=32$



Soln: Find B

$$\frac{\sin(B)}{10} = \frac{\sin(113^\circ)}{32}$$

↓ mult by 10

$$\sin(B) = \frac{10\sin(113^\circ)}{32}$$

↓ take arcsin

$$B = \sin^{-1}\left(\frac{10\sin(113^\circ)}{32}\right) \approx 16.72^\circ$$

Second solution?

$B_{\text{second}} = 180^\circ - 16.72^\circ$

$= 163.28^\circ$

Too big because known angle is 113°.

ONLY ONE solution!

Find A

$$119^\circ + 16.72^\circ + C = 180^\circ$$

$$C = 180^\circ - 119^\circ - 16.72^\circ = 44.28^\circ$$

Find a

$$\frac{\sin(44.28^\circ)}{a} = \frac{\sin(119^\circ)}{14}$$

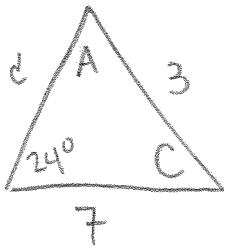
Multiply by a to get

$$\sin(44.28^\circ) = a\,\frac{\sin(119^\circ)}{14}$$

Mult. by $\frac{14}{\sin(119^\circ)}$ to get

$$a = \frac{14\sin(44.28^\circ)}{\sin(119^\circ)} \approx 11.175$$

#20] Solve



Soln: Find A

$$\frac{\sin(24^\circ)}{3} = \frac{\sin(A)}{7}$$

↓ mult by 7

$$\sin(A) = \frac{7\sin(24^\circ)}{3}$$

↓

$$A = \sin^{-1}\left(\frac{7\sin(24^\circ)}{3}\right) \approx 71.632$$

Second solution?

$$A = 180^\circ - 71.632^\circ$$
$$= 108.368^\circ$$

Small enough!

So we get two solutions

Two solutions:

$A = 71.632^\circ$

Find C

$71.632^\circ + 24^\circ + C = 180^\circ$

$\downarrow$

$C = 180^\circ - 71.632^\circ - 24^\circ$

$= 84.368^\circ$

Find c

$$\frac{\sin(84.368^\circ)}{c} = \frac{\sin(24^\circ)}{3}$$

$\downarrow$

$$c = \frac{3\sin(84.368^\circ)}{\sin(24^\circ)}$$

≈ 7.340

$A = 108.368^\circ$

Find C

$108.368^\circ + 24^\circ + C = 180^\circ$

$C = 180^\circ - 108.368^\circ - 24^\circ$

$= 47.632^\circ$

Find c

$$\frac{\sin(47.632^\circ)}{c} = \frac{\sin(24^\circ)}{3}$$

$\downarrow$

$$c = \frac{3\sin(47.632^\circ)}{\sin(24^\circ)}$$

≈ 5.449