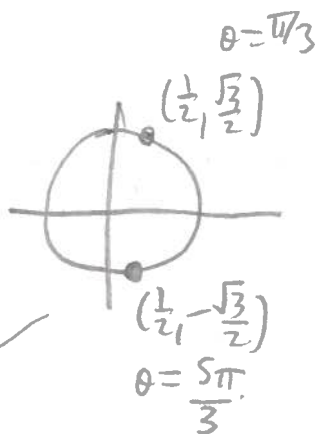


§9.5

#6 $2\cos(\theta) = 1$

\downarrow
 $\cos(\theta) = \frac{1}{2}$

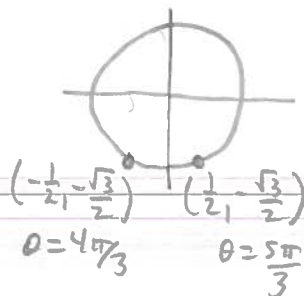
\downarrow
 $\theta = \frac{\pi}{3}, \frac{5\pi}{3}$



#16 $2\sin(\theta) = -\sqrt{3}$

\downarrow
 $\sin(\theta) = -\frac{\sqrt{3}}{2}$

\downarrow
 $\theta = \frac{4\pi}{3}, \frac{5\pi}{3}$



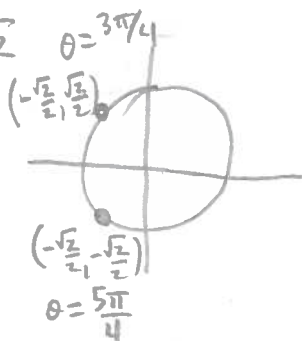
#19 $2\cos(3\theta) = -\sqrt{2}$

$\downarrow \psi = 3\theta$
 $\cos(\psi) = -\frac{\sqrt{2}}{2}$

\downarrow

$\begin{cases} 3\theta = \psi = \frac{3\pi}{4} + 2n\pi \\ 3\theta = \psi = \frac{5\pi}{4} + 2n\pi \end{cases}$

$\begin{cases} 3\theta = \psi = \frac{3\pi}{4} + 2n\pi \\ 3\theta = \psi = \frac{5\pi}{4} + 2n\pi \end{cases}$



$0 \leq \theta < 2\pi \rightarrow 0 \leq \psi < \frac{24\pi}{12}$

$\begin{cases} \theta = \frac{3\pi}{12} + \frac{2n\pi}{3} = \frac{3\pi + 8n\pi}{12} \\ \theta = \frac{5\pi}{12} + \frac{2n\pi}{3} = \frac{5\pi + 8n\pi}{12} \end{cases}$

~~$n=3: \begin{cases} \theta = \frac{27\pi}{12} \times \\ \theta = \frac{29\pi}{12} \times \end{cases}$~~

$n=2: \begin{cases} \theta = \frac{19\pi}{12} \checkmark \\ \theta = \frac{21\pi}{12} \checkmark \end{cases}$
 $n=1: \begin{cases} \theta = \frac{11\pi}{12} \checkmark \\ \theta = \frac{13\pi}{12} \checkmark \end{cases}$
 $n=0: \begin{cases} \theta = \frac{3\pi}{12} \checkmark \\ \theta = \frac{5\pi}{12} \checkmark \end{cases}$

~~$n=-1: \begin{cases} \theta = -\frac{5\pi}{12} \times \\ \theta = -\frac{3\pi}{12} \times \end{cases}$~~

X

$$\#25 \quad 2\cos^2(t) + \cos(t) = 1$$

$$\downarrow$$
$$2\cos^2(t) + \cos(t) - 1 = 0$$

$$\downarrow \text{factor}$$
$$(2\cos(t) - 1)(\cos(t) + 1) = 0$$

$$2\cos(t) - 1 = 0$$

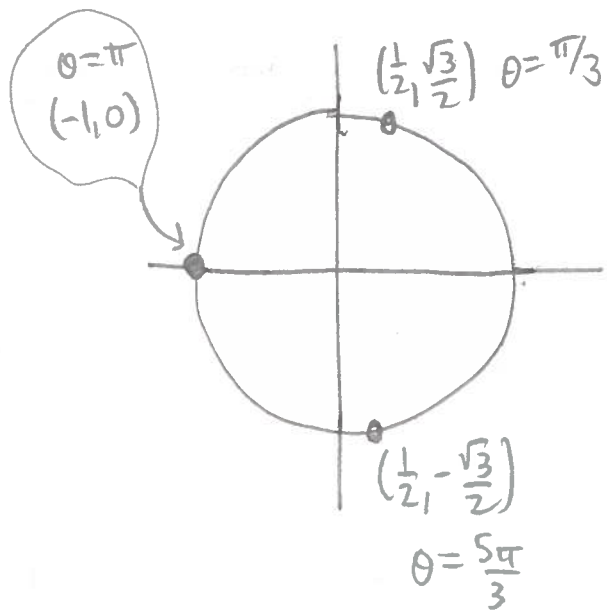
$$\downarrow$$
$$\cos(t) = \frac{1}{2}$$

$$\downarrow$$
$$t = \frac{\pi}{3}, \frac{5\pi}{3}$$

$$\cos(t) + 1 = 0$$

$$\downarrow$$
$$\cos(t) = -1$$

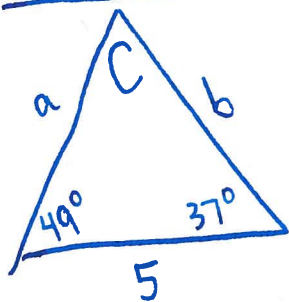
$$\downarrow$$
$$t = \pi$$



§10.1

#11

Find b:



Soln: First find C

$$49^\circ + 37^\circ + C = 180^\circ$$

$$C = 180^\circ - 49^\circ - 37^\circ = 94^\circ$$

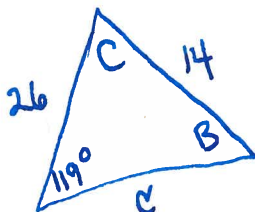
Now find b

$$\frac{\sin(49^\circ)}{b} = \frac{\sin(94^\circ)}{5}$$



$$b = \frac{5 \sin(49^\circ)}{\sin(94^\circ)} \approx 3.78$$

#14 Solve



Soln: Find B

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

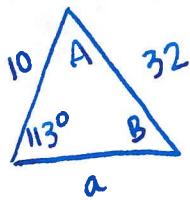
$$\Rightarrow \sin(B) = \frac{26 \sin(119^\circ)}{14}$$

$$\Rightarrow B = \sin^{-1}\left(\frac{26 \sin(119^\circ)}{14}\right) \text{ DOES NOT EXIST}$$

1.40

⇒ NO SOLN

#15 Solve



Soln: Find B

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

⇓

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

⇓

$$B = \sin^{-1}\left(\frac{10 \sin(113^\circ)}{32}\right) \approx 16.717^\circ$$

Also check: $B_2 = 180^\circ - 16.717^\circ = 163.283^\circ$

⇒ TOO BIG!!

⇒ only one soln here

Find A

$$113^\circ + 16.717^\circ + A = 180^\circ$$

$$\Rightarrow A = 180^\circ - 113^\circ - 16.717^\circ = 50.283^\circ$$

Find a

$$\frac{\sin(50.283^\circ)}{a} = \frac{\sin(113^\circ)}{32}$$

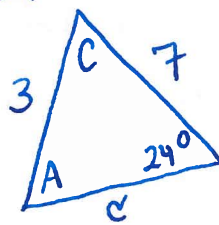
⇓

$$a = \frac{32 \sin(50.283^\circ)}{\sin(113^\circ)}$$

$$\approx 26.740$$

#20

Solve



Soln: Find A

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

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

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

$$\approx 71.632^\circ$$

Also check:

$$A_2 = 180^\circ - 71.632^\circ = 108.368^\circ$$

⇒ NOT too big

⇒ two solutions

$$A = 71.632^\circ$$

Find C

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

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

$$= 84.368^\circ$$

Find c

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

⇓

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

$$= 7.340$$

$$A_2 = 108.368^\circ$$

Find C_2

$$108.368^\circ + 24^\circ + C_2 = 180^\circ$$

$$C_2 = 180^\circ - 108.368^\circ - 24^\circ$$

$$= 47.632^\circ$$

Find c

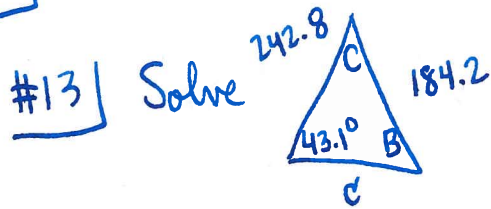
$$\frac{\sin(47.632^\circ)}{c} = \frac{\sin(24^\circ)}{3}$$

⇓

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

$$\approx 5.449$$

§10.2



Soln: Find B

$$\frac{\sin(B)}{242.8} = \frac{\sin(43.1^\circ)}{184.2}$$

⇓

$$\sin(B) = \frac{242.8 \sin(43.1^\circ)}{184.2}$$

⇓

$$B = \sin^{-1}\left(\frac{242.8 \sin(43.1^\circ)}{184.2}\right)$$

$$\approx 64.24^\circ$$

Also check: $B_2 = 180^\circ - 64.24^\circ$
 $= 115.76^\circ$

⇒ NOT too big

⇒ two solns

$$B = 64.24^\circ$$

Find C

$$43.1^\circ + 64.24^\circ + C = 180^\circ$$

$$C = 180^\circ - 43.1^\circ - 64.24^\circ$$

$$= 72.66^\circ$$

Find c

$$c^2 = (184.2)^2 + (242.8)^2$$

$$- 2(184.2)(242.8)\cos(72.66^\circ)$$

$$= 66222.42035$$

$$\Rightarrow c = \sqrt{66222.42035}$$

$$\approx 257.3371$$

$$B_2 = 115.76^\circ$$

Find C

$$43.1^\circ + 115.76^\circ + C = 180^\circ$$

$$C = 180^\circ - 43.1^\circ - 115.76^\circ$$

$$= 21.14^\circ$$

Find c

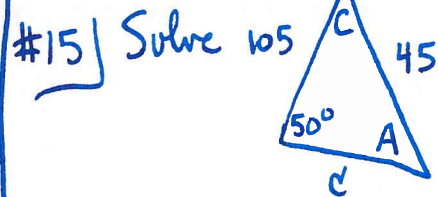
$$c^2 = (184.2)^2 + (242.8)^2$$

$$- 2(184.2)(242.8)\cos(21.14^\circ)$$

$$= 9453.6007$$

$$\Rightarrow c = \sqrt{9453.6007}$$

$$\approx 97.230^\circ$$



Soln: Find A

$$\frac{\sin(50^\circ)}{45} = \frac{\sin(A)}{105}$$

$$\Rightarrow \sin(A) = \frac{105 \sin(50^\circ)}{45}$$

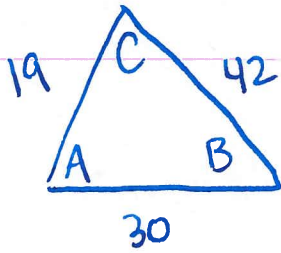
$$\Rightarrow A = \sin^{-1}\left(\frac{105 \sin(50^\circ)}{45}\right)$$

= 1.78

⇒ does not exist!

⇒ NO SOLN

#16 | Solve for angle A

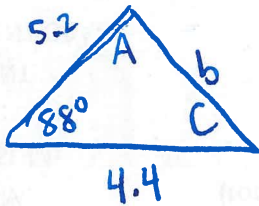


Soln: $42^2 = 19^2 + 30^2 - 2(19)(30)\cos(A)$

$$\Rightarrow \frac{42^2 - 19^2 - 30^2}{-2(19)(30)} = \cos(A)$$

$$\Rightarrow A = \cos^{-1}(-0.4412) \\ \approx 116.182^\circ$$

#22 | Solve



Soln: Find b

$$b^2 = 5.2^2 + 4.4^2 - 2(5.2)(4.4)\cos(88^\circ) \\ \approx 44.8029$$

$$\Rightarrow b = \sqrt{44.8029} \approx 6.6935$$

Find A

$$4.4^2 = 5.2^2 + (6.6935)^2 - 2(5.2)(6.6935)\cos(A)$$

$$\Rightarrow 19.36 = 71.84 - 69.6124\cos(A)$$

$$\Rightarrow \cos(A) = \frac{19.36 - 71.84}{-69.6124} = 0.75388$$

$$\Rightarrow A = \cos^{-1}(0.75388) \approx 41.0716^\circ$$

Find C

$$88^\circ + 41.0716^\circ + C = 180^\circ$$

$$\Rightarrow C = 180^\circ - 88^\circ - 41.0716^\circ = 50.9284^\circ$$