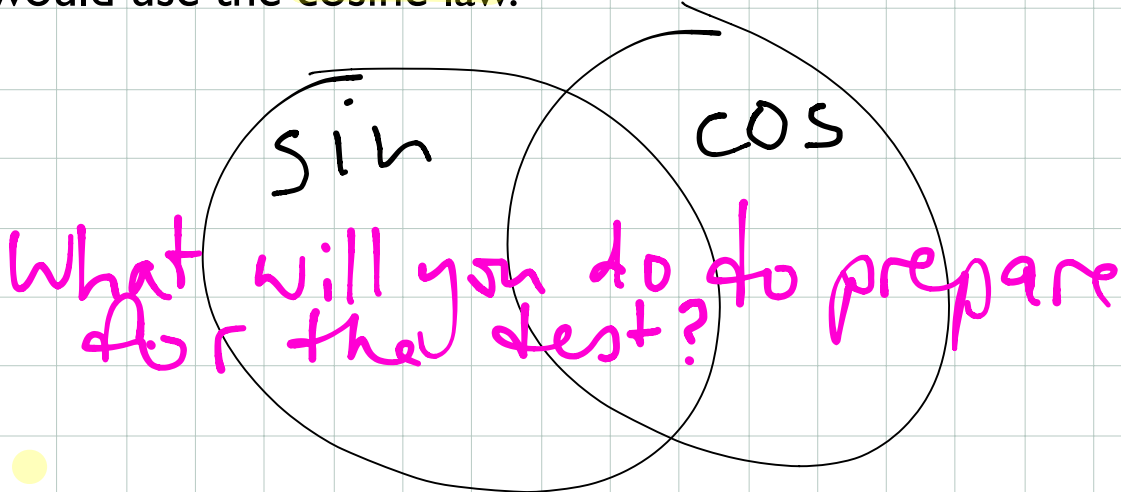


Journal #2

- Explain when you would use the sine law versus when you would use the cosine law.



$$\begin{array}{l|l} c^2 b^2 a^2 = c^2 - b^2 & \cos A = \frac{b}{c} \\ c^2 = a^2 + b^2 & \tan A = \frac{a}{b} \end{array}$$

$$b^2 = a^2 + c^2 - 2ac \cos B \leftarrow \text{SAS}$$

SSS $\cos B = \frac{b^2 - a^2 - c^2}{-2ac}$

$$\frac{b}{\sin B} = \frac{c}{\sin C}$$

$\sin B$ $\sin C$ b c

p. 81

	$\angle A < 90^\circ$ acute	$\angle A > 90^\circ$ obtuse
0	$a < h$ $h = b \sin A$	$a \leq b$
1	$a = h$ or $a \geq b$	$a > b$
2	$h < a < b$	n/a

p. 104 # 6-8

a) $\frac{\sin B}{b} = \frac{\sin A}{a}$ SSA

$\frac{\sin B}{1} = \frac{\sin 38^\circ}{17.2}$ ✓

$$\sin B = \frac{5.4 \sin 38^\circ}{10.3}$$

$$\angle B = 19^\circ \quad \checkmark$$

b) $\frac{b}{\sin B} = \frac{c}{\sin C}$ ASA

$$180^\circ - (35^\circ + 25^\circ)$$

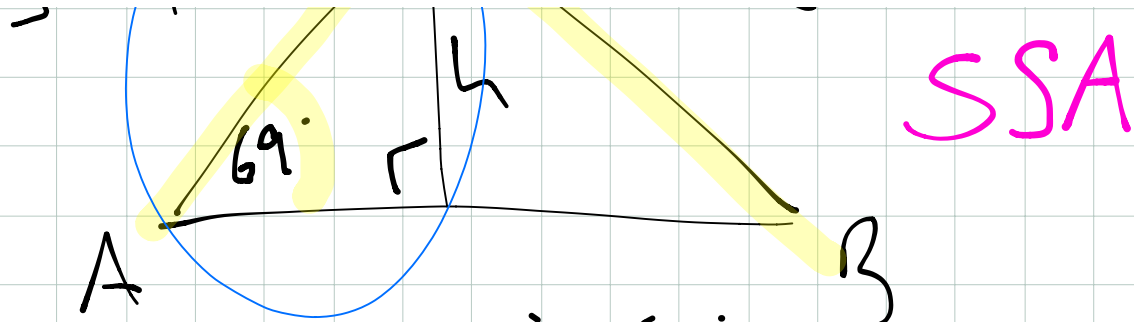
$$\frac{b}{\sin 120^\circ} = \frac{100}{\sin 25^\circ}$$

$$b = \sin 120^\circ \left(\frac{100}{\sin 25^\circ} \right)$$

$$b = 205$$

7.) a) C

$h = 11.4$  $a = 10.1$

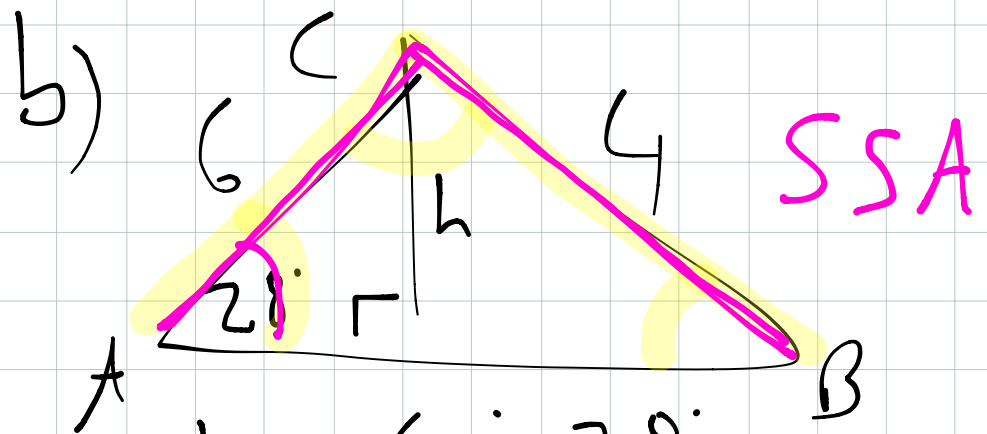


SSA

$$h = 11.4 \sin 69^\circ$$

$$h = 10.6$$

$a < h \rightarrow$ No Δ !



SSA

$$h = 6 \sin 28^\circ$$

$$h = 2.8$$

$h < a < b$
 $\Rightarrow 2 \Delta$'s!

[SSA] \rightarrow sine law

$$\frac{\sin B}{b} = \frac{\sin 28^\circ}{1}$$

$$\sin B = \frac{6 \sin 28^\circ}{4} = 0.704\dots$$

1. $\angle B = 45^\circ$

$$\angle C = 180^\circ - 45^\circ - 28^\circ$$

2. $\angle C = 107^\circ$

$$c^2 = a^2 + b^2 - 2ab \cos C$$

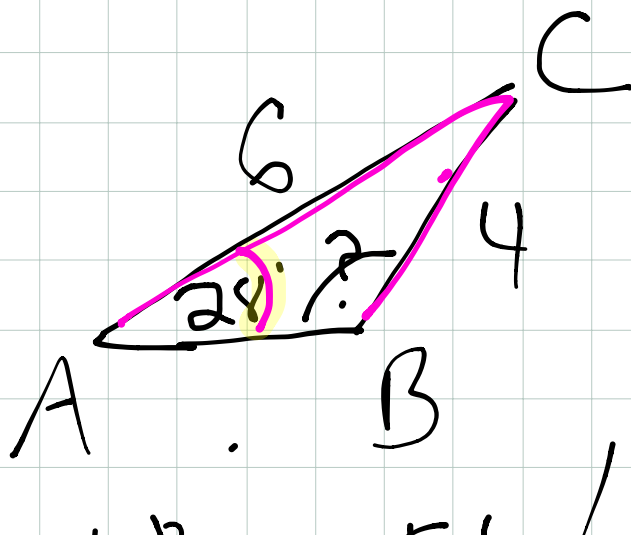
or

3. $c = 8.1$

$$\frac{c}{\sin C} = \frac{a}{\sin A}$$

$\triangle \# 2$:

SSA



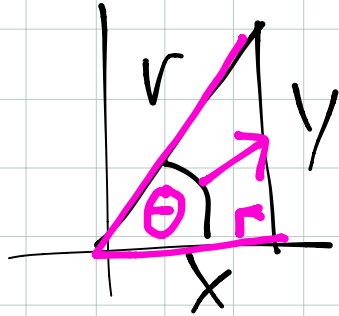
$$\angle B = 180^\circ - 45^\circ$$

$$\angle B = 135^\circ$$

$$\angle C = 17^\circ \rightarrow c = ?$$

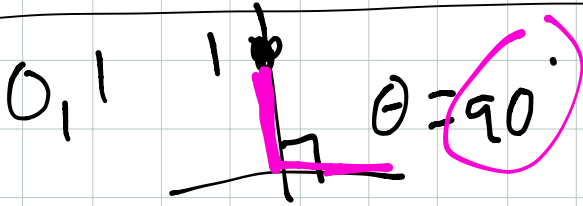
$$c = 2.5$$

I



$\sin \theta$	$\cos \theta$	$\tan \theta$
$\frac{y}{r}$	$\frac{x}{r}$	$\frac{y}{x}$

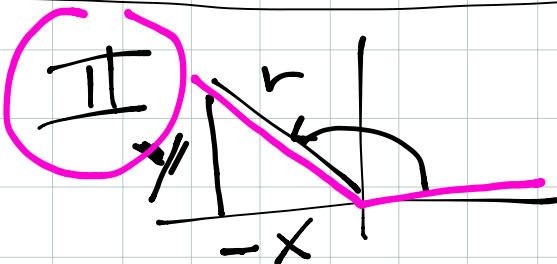
all pos (> 0).



1
 $y = 1$

0
 $x = 0$

n/a



+

-

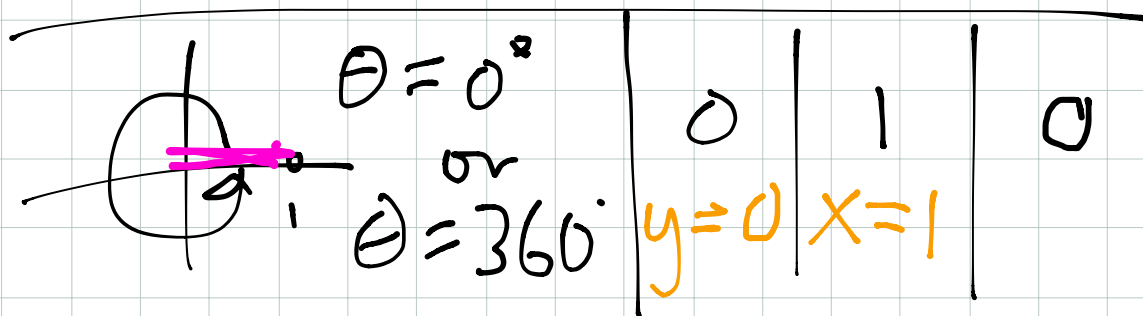
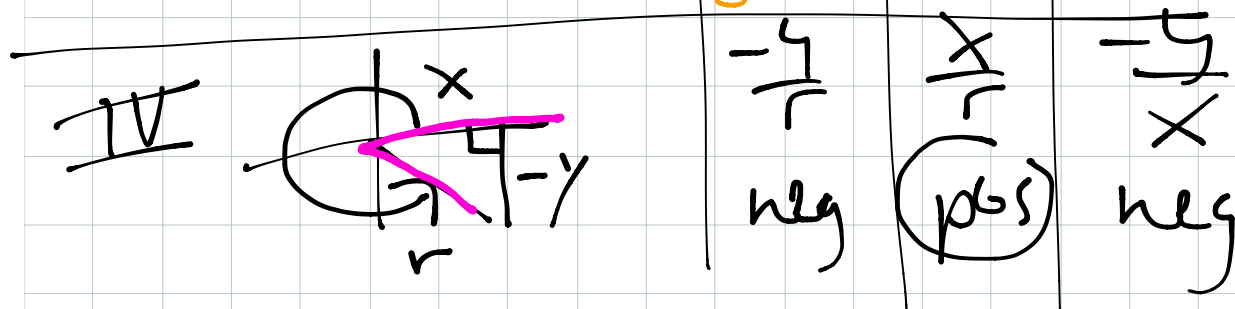
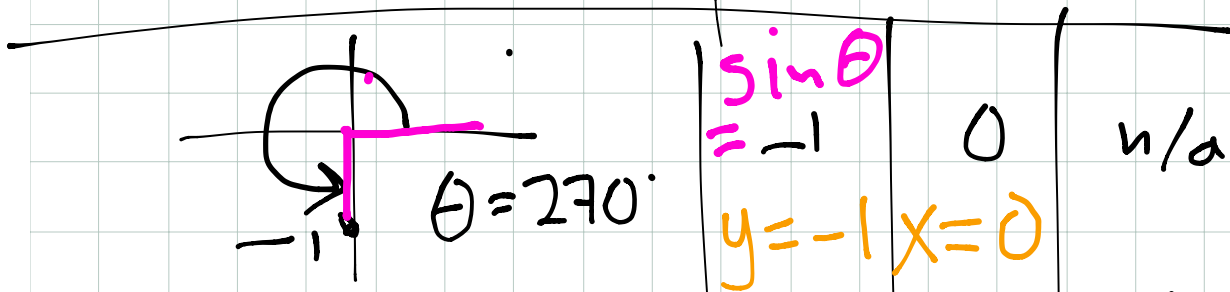
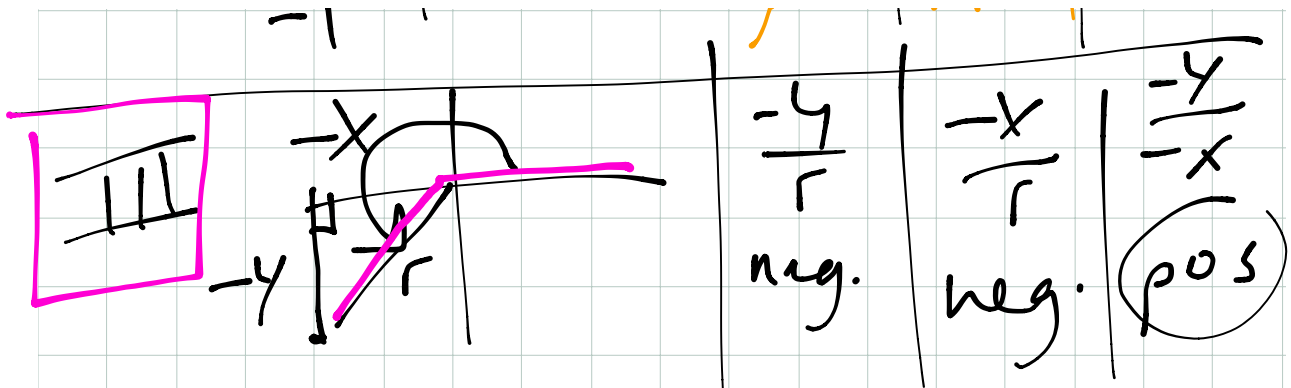
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0
 $y = 0$

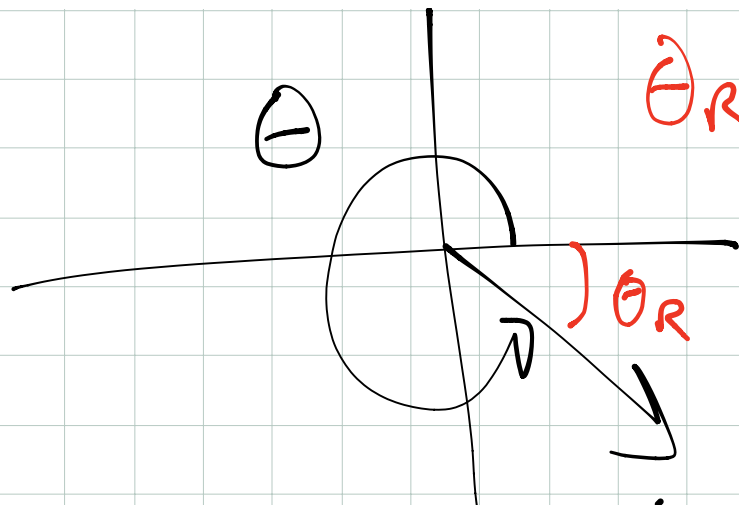
-1
 $x = -1$

0



p. 103 # 1-2

2c) $\sin 315^\circ$



$$\theta_R = 360^\circ - 315^\circ$$

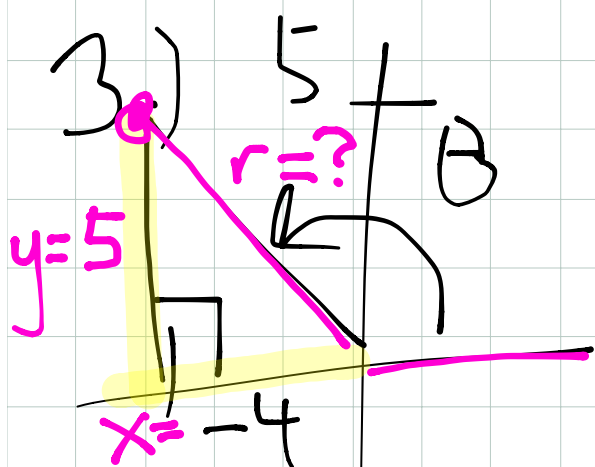
$$\boxed{\theta_R = 45^\circ}$$

$$\sin 45^\circ = \frac{1}{\sqrt{2}}$$

IV

$$\sin 315^\circ = -\sin 45^\circ$$

$$\boxed{\sin 315^\circ = -\frac{1}{\sqrt{2}}}$$



$$x = -4$$

$$y = 5$$

$$r = \sqrt{x^2 + y^2}$$

$$r = \sqrt{41}$$

$$\sin \theta = \frac{y}{r} = \frac{5}{\sqrt{41}}$$

$$\cos \theta = \frac{x}{r} =$$

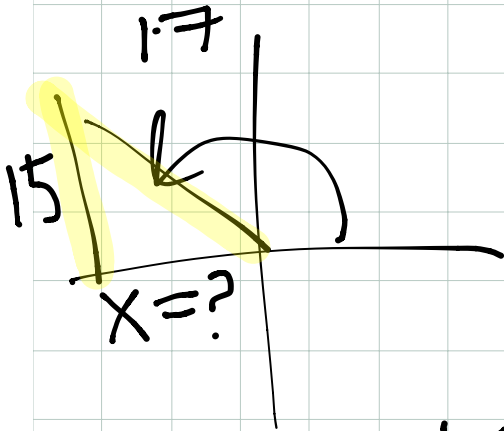
$$\frac{-4}{\sqrt{41}}$$

$$\tan \theta = \frac{y}{x} =$$

$$\frac{5}{-4}$$

$$4.) \sin \theta = \frac{15}{17}$$

(II)



$$y = 15$$

$$r = 17 \text{ hyp.}$$

$$x^2 = r^2 - y^2$$

$$x = \sqrt{17^2 - 15^2}$$

$$x = \pm 8$$

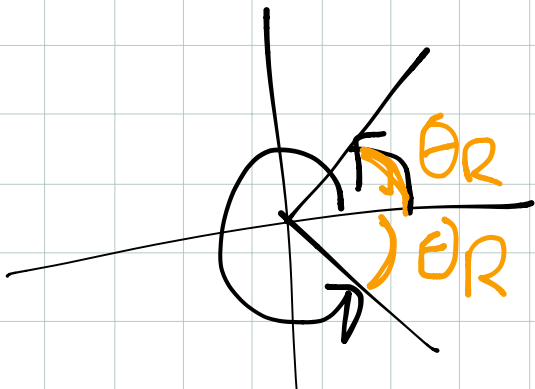
$$\textcircled{\text{II}} \rightarrow \boxed{x = -8}$$

$$\cos \theta = \frac{-8}{17}$$

$$\tan \theta = \frac{15}{-8} = -\frac{15}{8}$$

$$5.) \cos \theta = 0.5877$$

$\hookrightarrow \text{I, IV}$



$$\theta_R = \cos^{-1}(0.5877)$$
$$\tan = +54^\circ$$

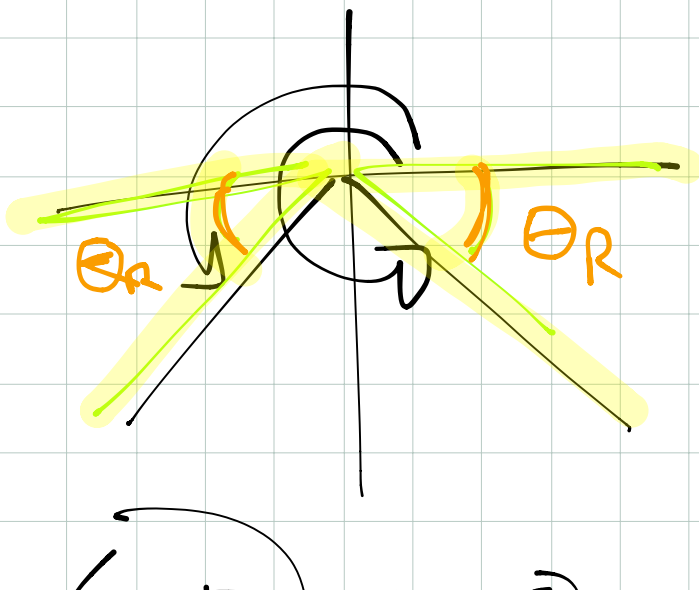
I $\theta = 54^\circ$

IV $\theta = 360^\circ - 54^\circ$

$\theta = 306^\circ$

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

III, IV



$\theta_R = \sin^{-1}\left(\frac{\sqrt{3}}{2}\right)$

$\theta_R = 60^\circ$

$$\textcircled{\text{III}} \rightarrow \begin{aligned} \theta &= 180 + 60 \\ \theta &= 240^\circ \end{aligned}$$

$$\textcircled{\text{IV}} \rightarrow \begin{aligned} \theta &= 360^\circ - 60^\circ \\ \theta &= 300^\circ \end{aligned}$$