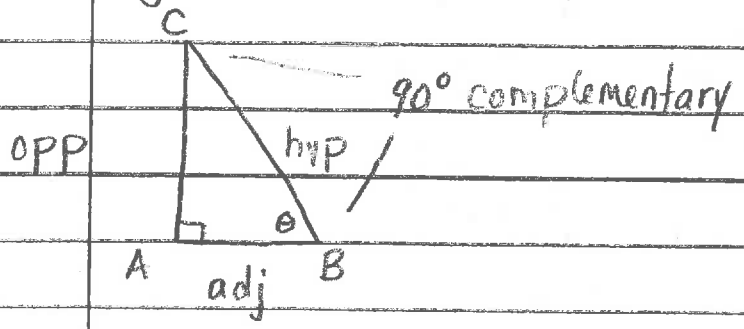
Definitions of Trigonometry

Right Δ Relationships

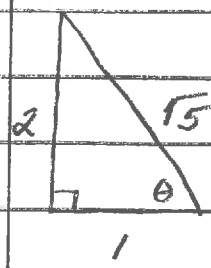


Primary Trig Ratios

SOH CAH TOA

$\sin\theta = \frac{opp}{hyp}$ $\cos\theta = \frac{adj}{hyp}$ $\tan\theta = \frac{opp}{adj}$

① Find the 3 trig rates of θ



$\sin\theta = \frac{2}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}}$

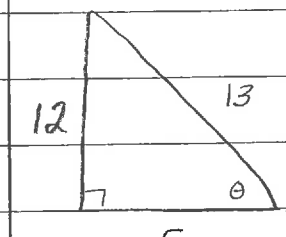
$= \frac{2\sqrt{5}}{5}$

$\cos\theta = \frac{1}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \boxed{\frac{\sqrt{5}}{5}}$

$\tan\theta = \frac{2}{1}$

CAH

(2) Given $\cos\theta = \frac{5}{13}$ (adj / hyp) find the other 2 trig functions of θ



$5^2 + b^2 = 13^2$

$25 + b^2 = 169$

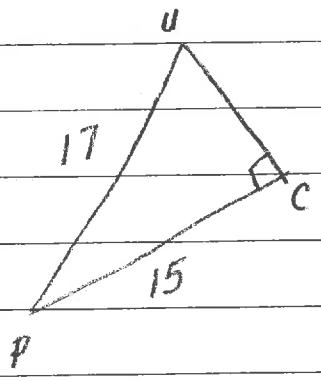
$-25 \quad -25$

$b^2 = 144$

$b = 12$

SOH $\sin\theta = \frac{12}{13}$ TOA $\tan\theta = \frac{12}{5}$

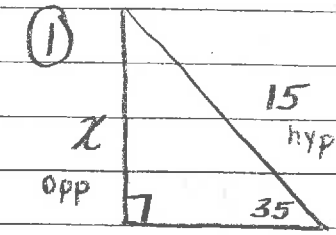
3) What is the sine of $\angle U$



Use Trig to Solve for a missing Side (Right Δs)

Calc must x in degrees

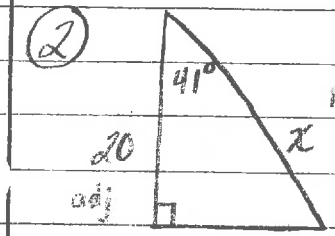
SOH CAH TOA

① 

$\sin 35 = \left(\frac{x}{15}\right)$

$15(0.57358) = \left(\frac{x}{15}\right) \times 15$

$8.60 = x$

② 

$\cos 41 = \left(\frac{20}{x}\right)$

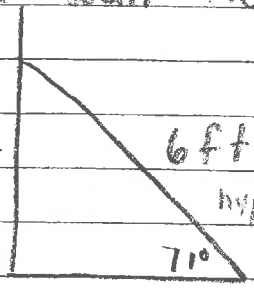
$x(0.7547) = \left(\frac{20}{x}\right)x$

$\frac{0.7547x}{0.7547} = \frac{20}{0.7547}$

$x = 26.5$

* Be sure your answer makes sense! Hyp is always the longest side. It must be longer than 20

③ A ladder 6 ft long leans against a wall and makes an angle of 71° with the ground. Find to the nearest tenth of a ft how high up the wall the ladder will reach.



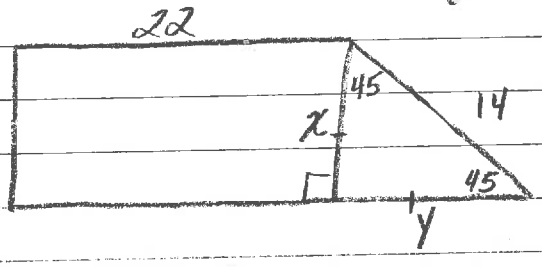
$\sin 71 = \frac{x}{6}$

$6(0.945) = \left(\frac{x}{6}\right)6$

$5.67 = x$

5.7 ft

4) Using the information given find the area of the trapezoid to the nearest square unit.



$\sin 45 = \frac{x}{14}$

$14 \times (0.7071) = \left(\frac{x}{14}\right) \times 14$

$9.899 = x$

$A = \frac{1}{2}(b_1 + b_2) \times h$

$= \frac{1}{2}(22 + 9.899) \times 9.899$

$= \frac{1}{2}(31.899) \times 9.899$

$= 15.9495 \times 9.899$

$= 157.88$

$= \boxed{158 \text{ in}^2}$

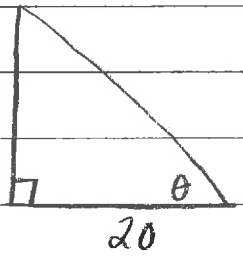
$\cos 45 = \frac{y}{14}$

$0.7071 = \frac{y}{14}$

$9.899 = y$

Using Trig to find an Angle (Right Δs)

* Calc must be in degrees!

① 

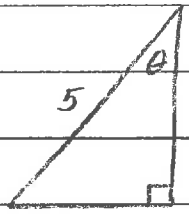
TOA

$\tan\theta = \frac{15}{20}$

$\tan^{-1}\left(\frac{15}{20}\right) = 36.9$

$= 37°$

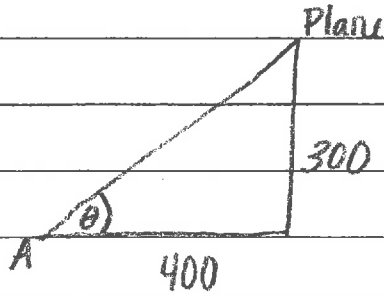
② A ladder leans against a wall
What is the angle between the ladder and the wall?



SOH $\sin\theta = \frac{2.5}{5}$

$\sin^{-1}\left(\frac{2.5}{5}\right) = 30°$

③ Find the angle of elevation of the plane from pt A on the ground

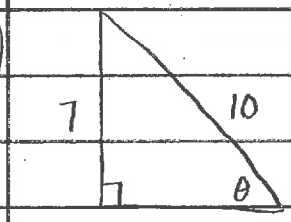


TOA $\tan\theta = \frac{300}{400}$

$\tan^{-1}\left(\frac{300}{400}\right) = 36.86$

$= 37°$

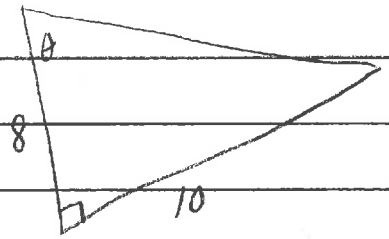
4) Find the measure of θ



SOH $\sin\theta = \frac{7}{10}$

$\sin^{-1}\left(\frac{7}{10}\right) = 44.4°$

5)



TOA $\tan\theta = \frac{10}{8}$

51.34