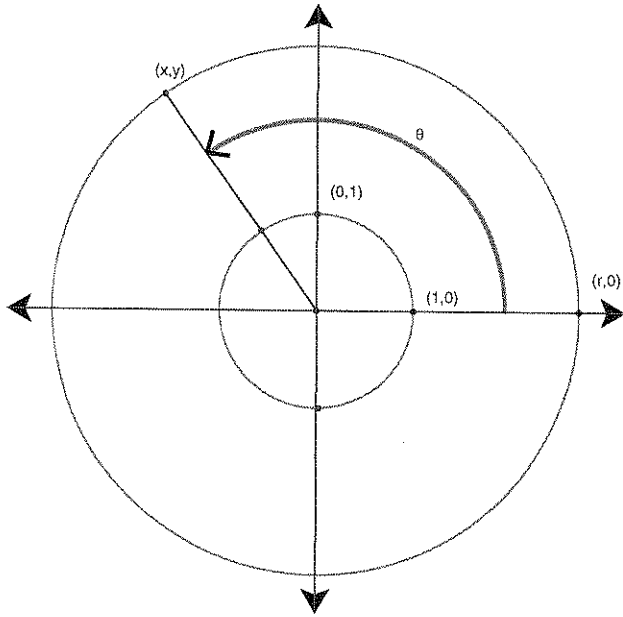


1. Complete the following statement:



r = radius of a circle with a center at $(0,0)$
 θ = degree of rotation, centered at $(0,0)$, from the positive x axis to the radius
 Any point (x,y) can be thought of as $(\cos \theta, \sin \theta)$

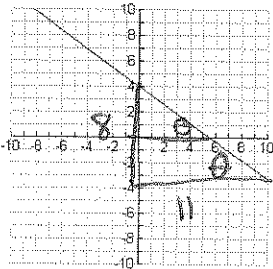
2. In $\triangle BAC$, $\angle C$ is a right angle and $\sin \angle B = \frac{15}{17}$



a. Find the $\cos \angle B = \frac{8}{17}$

b. Find the $\tan \angle A = \frac{8}{15}$

3. The equation of a line is $y = \frac{-8}{11}x + 4$, What is the angle between the line and the x -axis?

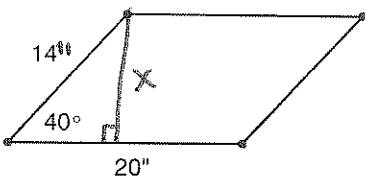


$$\tan \theta = \frac{8}{11}$$

$$\theta = \tan^{-1}\left(\frac{8}{11}\right)$$

$$\theta \approx 36.03 \quad \boxed{36^\circ}$$

4. ABCD is a parallelogram. What is the area of parallelogram ABCD?

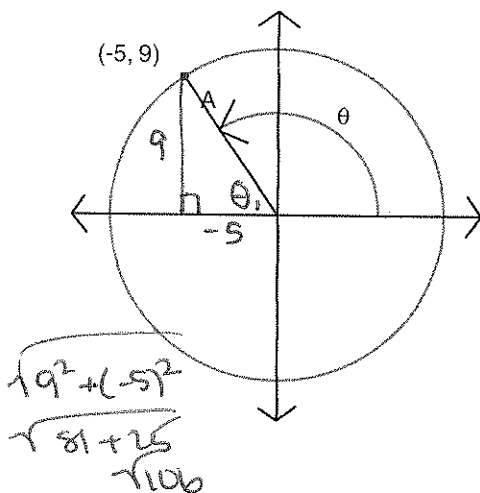


$$\begin{aligned} A &= b \cdot h \\ &= 20 (14 \cdot \sin 40) \\ &\approx 179.98 \end{aligned}$$

$$\begin{aligned} \sin 40^\circ &= \frac{x}{14} \\ 14 \cdot \sin 40^\circ &= x \end{aligned}$$

$$\boxed{179.98 \text{ sq in}^2}$$

5. Find the values of $\sin \theta$, $\cos \theta$ and $\tan \theta$



$$\sin \theta = \frac{9}{\sqrt{106}}$$

$$\cos \theta = -\frac{5}{\sqrt{106}}$$

$$\tan \theta = \frac{9}{-5}$$

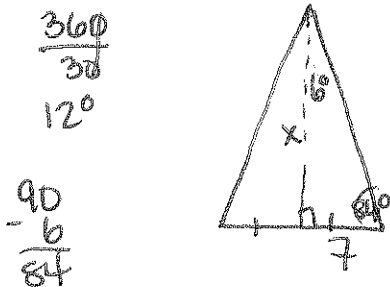
Find the degrees in θ (You should be able to check your answers above to see that all three are reasonable!)

$$\sin^{-1}\left(\frac{9}{\sqrt{106}}\right)$$

$$\theta_1 \approx 60.9$$

$$\theta = 180 - \theta_1 = 119.055 \quad \boxed{\approx 119^\circ}$$

6. Find the area of a regular 30 gon with sides of length 14 cm.



$$A_{30\text{GON}} = 30 A_{\text{TRIANGLE}}$$

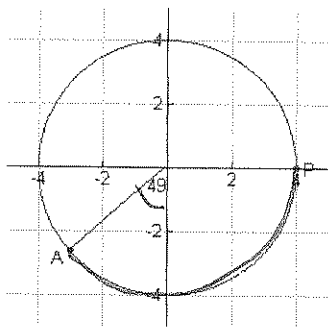
$$= 30 \cdot \frac{1}{2} b h$$

$$= 30 \cdot \frac{1}{2} (14) (7 \cdot \tan 84^\circ)$$

$$\approx 13986.115 \dots$$

$$\boxed{\approx 13,986 \text{ cm}^2}$$

$$\tan 84^\circ = \frac{x}{7} \Rightarrow x = 7 \cdot \tan(84^\circ)$$



$$\frac{90 + 49}{139}$$

7. a. Find the length of arc AP

$$L = 2\pi r \cdot \frac{\theta}{360}$$

$$= 2\pi (4) \left(\frac{139}{360}\right)$$

$$= \frac{139}{45} \pi$$

$$\approx 9.70 \text{ units.}$$

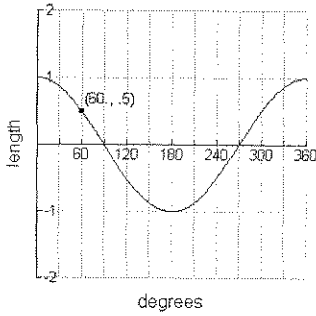
b. Find the area of the sector bounded by arc AP

$$S = \pi r^2 \frac{\theta}{360}$$

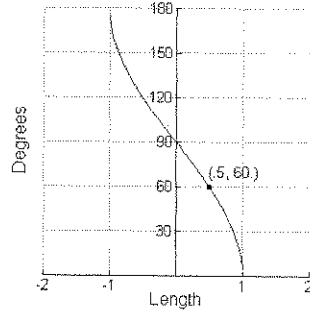
$$= \pi (4)^2 \frac{139}{360}$$

$$\approx 19.408 \text{ units}^2$$

8. Give the domain and range of these functions

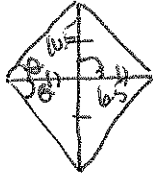


$D: \mathbb{R}$
 $R: -1 \leq y \leq 1$



$D: [-1, 1]$
 $R: [0, 180]$

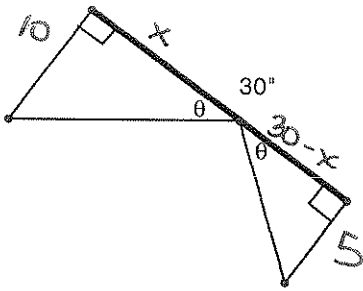
9. A rhombus has diagonals of lengths 13 cm and 21 cm. find the four angle measures of the rhombus.



$\tan \theta = \frac{10.5}{6.5}$
 $\theta = \tan^{-1}\left(\frac{10.5}{6.5}\right)$
 $\theta = 58.24 \Rightarrow 2\theta = 116.48^\circ$

10. Find the measure of theta θ . Be sure to justify your solution.

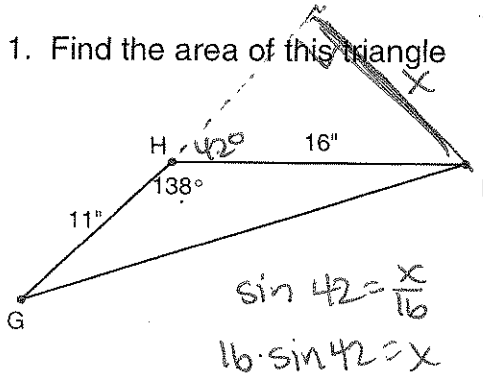
so $116^\circ, 116^\circ, 64^\circ, 64^\circ$



$\frac{10}{5} = \frac{x}{30-x}$
 $300 - 10x = 5x$
 $300 = 15x$
 $20 = x$

$\tan \theta = \frac{10}{20}$
 $\theta = \tan^{-1}\left(\frac{10}{20}\right)$
 $\approx 26.57^\circ$

11. Find the area of this triangle



$\sin 42 = \frac{x}{16}$
 $16 \cdot \sin 42 = x$

$A = \frac{1}{2}bh$
 $= \frac{1}{2}(11)(16 \cdot \sin 42)$
 $\approx 58.88 \text{ in}^2$

12. $\triangle RTS \sim \triangle MUN$ and if the $\cos \angle T = .6$ and the $\cos \angle N = .8$, what is the $\cos \angle U$? Explain your reasoning.



$\cos \angle U = .6$ or $3/5$

13. Why is this statement impossible? **The $\sin \theta = 2$** Explain your reasoning.

largest range value is 1 or $\sin \theta = \frac{\text{opp}}{\text{hyp}}$
 but if $\frac{\text{opp}}{\text{hyp}} > \text{hyp}$