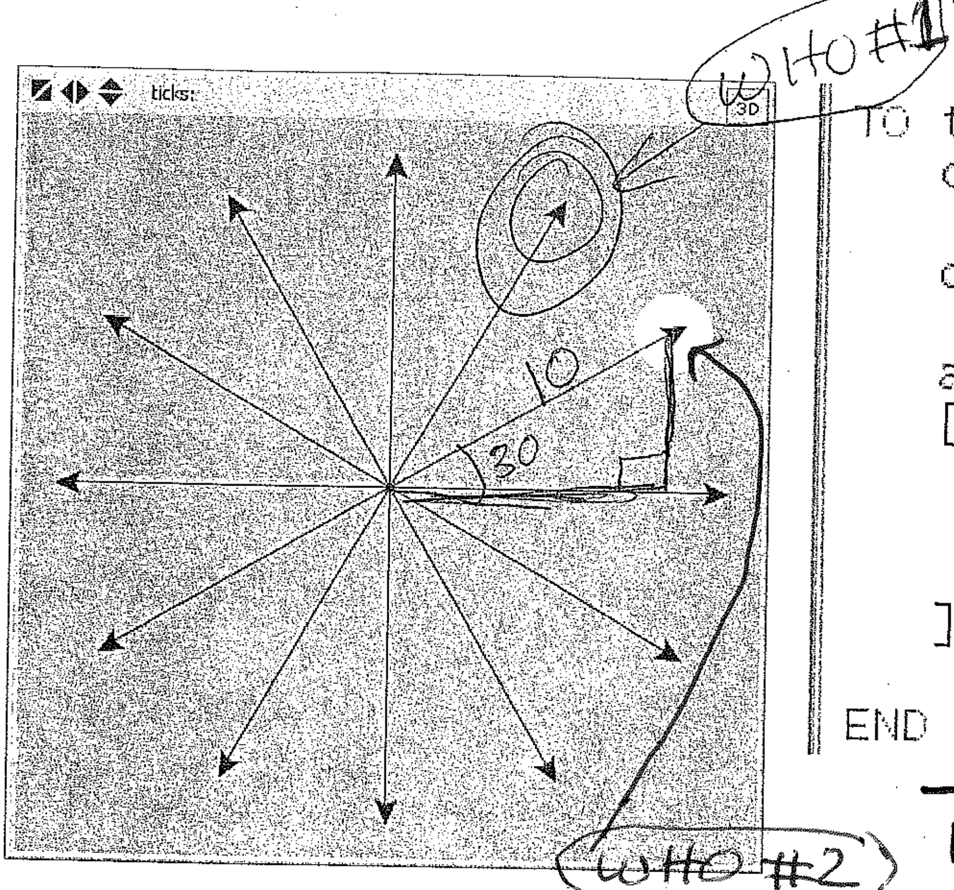
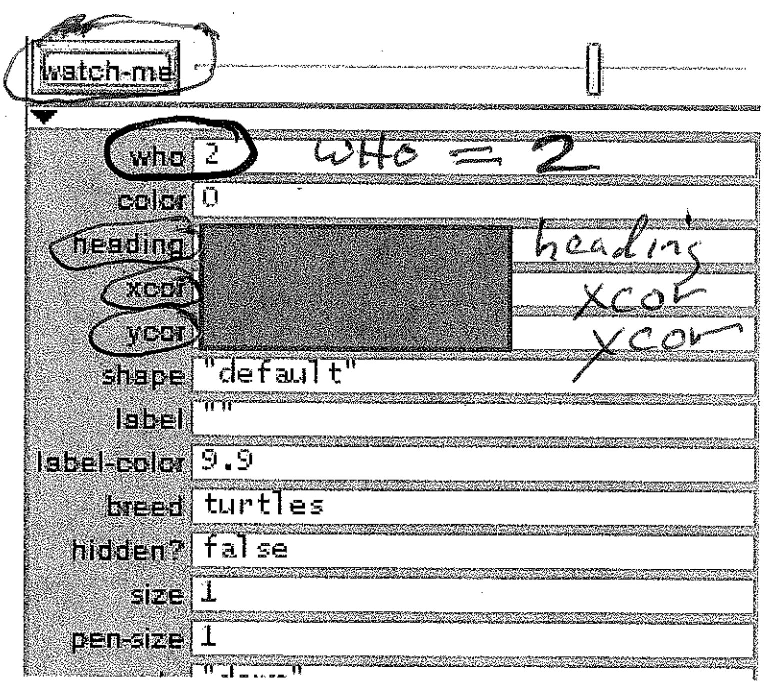



```
TO trigonometryTurtles
   ca

   cro 12

   ask turtles
   [
      set color black
      pd
      fd 10
   ]

END
```

$$\frac{360^\circ}{12 \text{ turtles}} = 30^\circ \text{ per turtle}$$

1. What is the **heading** of the highlighted turtle above? Show how you arrived at this.

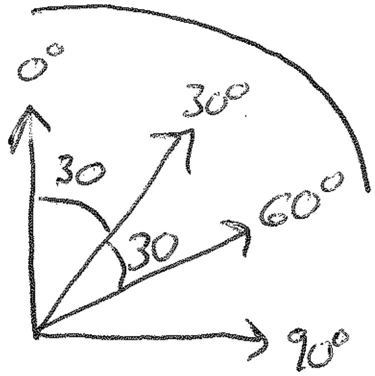
2. What is the **xcor** of the highlighted turtle that is being "watched" above? Carefully show all your work, illustrated with a picture/diagram and explain your reasoning and any trigonometry you used.



3. What is the **ycor** of the highlighted turtle in the watch circle? Show your work, illustrate your strategy with a diagram and explain your reasoning, as above.

4. For the turtle with who number 1, the turtle immediately to the left of turtle 2 here as you go counterclockwise, explain why you already have found the answer as to its (xcor, ycor) values in the turtle grid.

(1)



cro 12 means

$\frac{360}{12} = 30°$ per turtle

Turtle has heading of $90° - 30 = 60°$

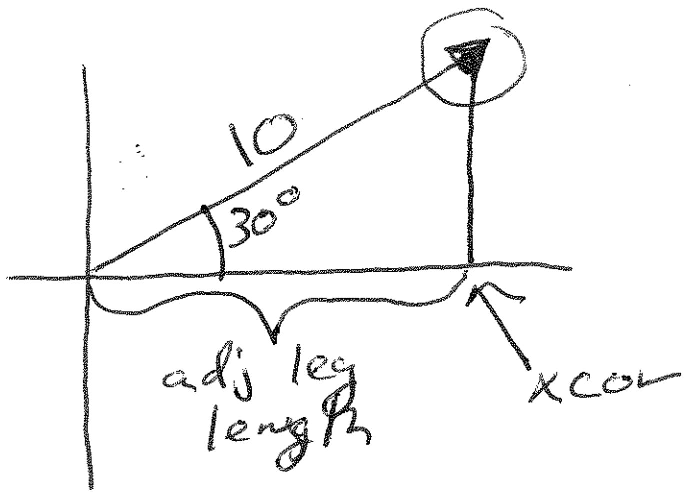
$\frac{360°}{12 \text{ turtles}} = 30°$ per turtle

30 degrees/slice

Or, turtle with who # 2 has heading of $2 * \frac{360}{12} = 2 * 30 = 60°$

---

(2) The xcor is same as the length of adjacent leg, since turtles start at (0, 0).



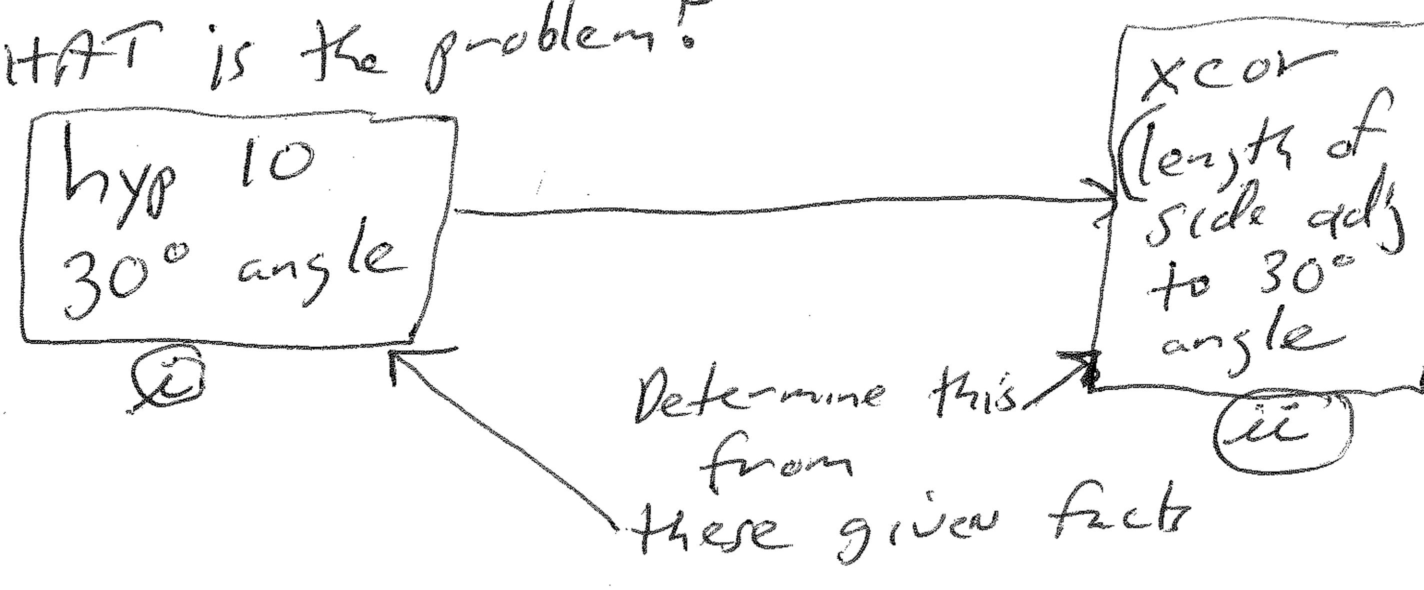
We know (are given)

hyp length = 10

angle = 30°

Goal, need to find, the result desired – xcor ← unknown

WHAT is the problem?



CAH is HOW to get the problem solved –

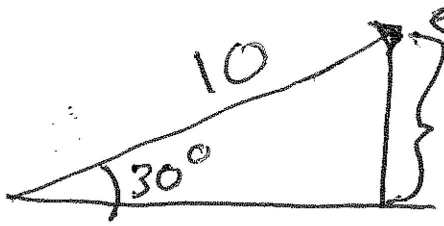
$$\text{Cosine}(30^\circ) = \frac{\text{adjacent}}{\text{hypotenuse}} = \frac{\text{xcor}}{10}$$

$$\cos(30^\circ) = \frac{\text{xcor}}{10}$$

$$10 * \cos(30^\circ) = \text{xcor}$$

---

③



turtle with who #2

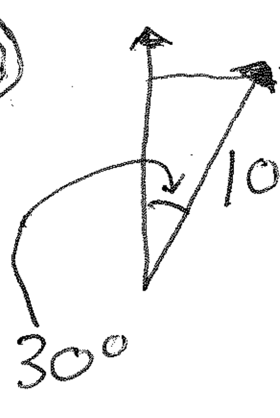
opposite side length = ycor

SOH $\quad \text{sine}(30^\circ) = \dfrac{\text{opp}}{\text{hyp}}$

$$\text{sine}(30^\circ) = \frac{\text{ycor}}{10}$$

$$10 * \text{Sine}(30^\circ) = \text{ycor}$$

④



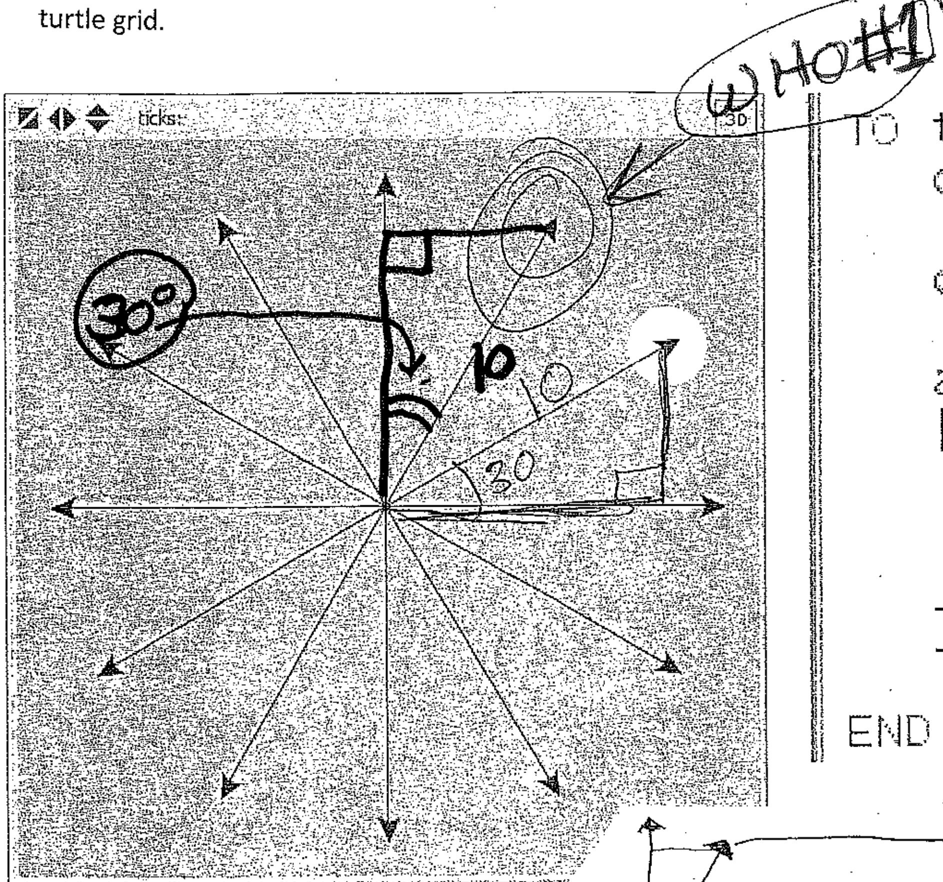
turtle with who #1

10 = hyp

What is xcor? The opp side from a 30° angle

what is ycor? The adjacent side to a 30° angle

4. For the turtle with who number 1, the turtle immediately to the left of turtle 2 here as you go counterclockwise, explain why you already have found the answer as to its (xcor, ycor) values in the turtle grid.

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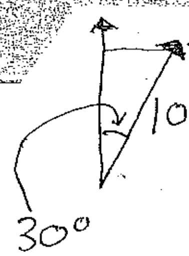

turtle with who #1

10 = hyp   What is xcor? The opp side from a 30° angle

30°   what is ycor? The adjacent side to a 30° angle