Questions on 6.6 homework?

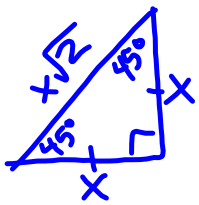
(14) $\frac{45^\circ}{1} \cdot \frac{\pi}{180^\circ} = \frac{45\pi}{180} = \frac{\pi}{4}$

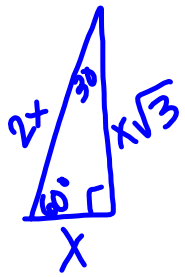
(20) $\frac{5\pi}{6} \cdot \frac{180^\circ}{\pi} = 150^\circ$

(1) $S = \frac{\theta}{360^\circ}(d\pi)$

$S = \frac{120^\circ}{360^\circ}(20\pi)$

$S = \frac{20\pi}{3}$





6.7 Staking It

A Solidify Understanding Task

After considering different plans for laying out the archeological site described in *Diggin' It,* Alyce, Javier and Veronica have decided to make concentric circles at 10-meter intervals from the central tower. They have also decided to use 16 stakes per circle, in order to have a few more points of reference. Using ropes of different lengths to keep the radius constant, they have traced out these circles in the sand. Because they know the circles will soon be worn away by the wind and people's footprints, they feel a sense of urgency to locate the positions of the 16 stakes that will mark each circle. The team wants to be efficient and make as few measurements as possible.

Part I

Veronica suggests they should locate the stakes around one circle and use those positions to mark where the stakes will go on all of the other circles.

1. What do you think about Veronica's idea? How will marking stake positions on one circle help them locate the positions of the stakes on all of the other circles?

Good idea, extend to other ⊙s.

Veronica has decided they should stake out the circle with a radius of 50 meters first. She is standing at the point (50,0) and knows she needs to move 22 ½° around the circle to place her next stake. But, she wonders, "How far is that?"

- Veronica decides she will find the distance by setting up a proportion using degree measurements.
- Alyce thinks they should find the distance by taking $\frac{1}{16}$ of the circumference.
- Javier thinks they should use radian measurement in their calculation.

2. Show how each team member will calculate this distance.

[V] $\frac{22.5^\circ}{360^\circ} = \frac{x}{100\pi}$

[J] $S = r\theta = 50 \cdot \frac{2\pi}{16} \approx 19.6$

$\frac{360x}{360} = \frac{22.5(100\pi)}{360}$

$x = \frac{100\pi}{16} \approx 19.6$ m

[A]

Part II

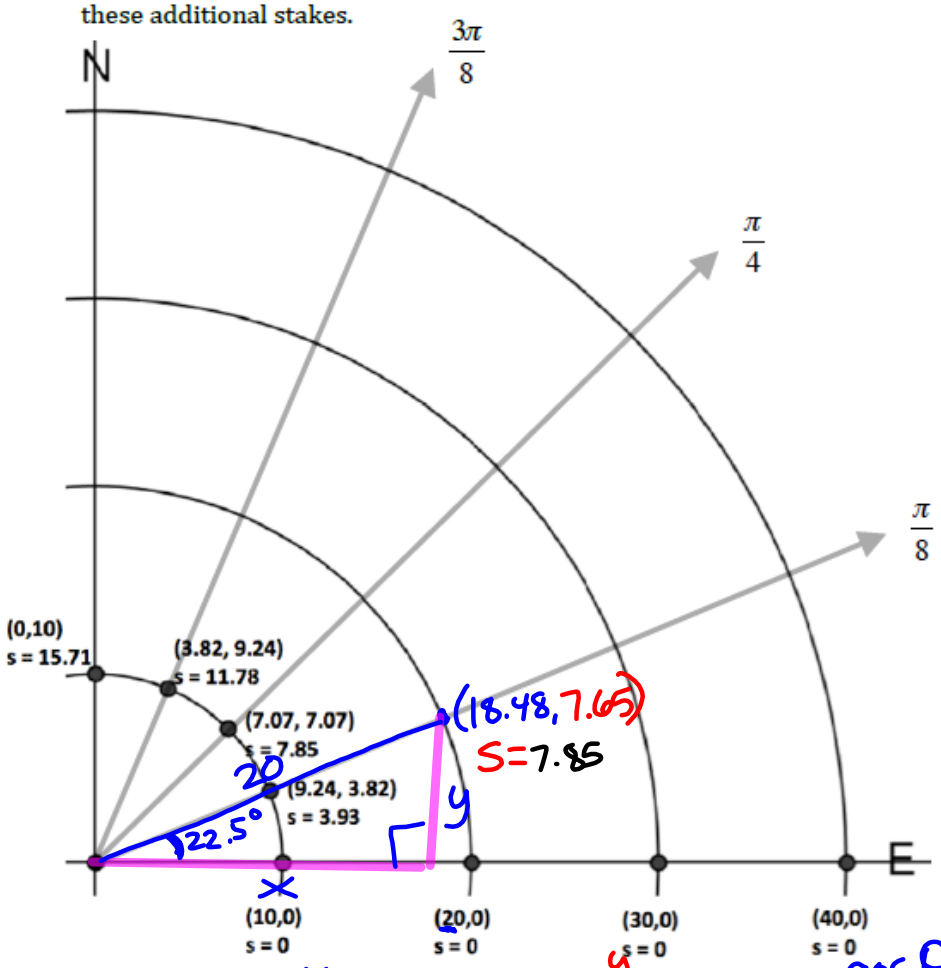
Javier has a different idea. He suggests that they should figure out the locations of all of the stakes in quadrant I first, and then it would be easy to find the locations of the stakes in all the other quadrants by using the quadrant I locations.

3. What do you think about Javier's suggestion? How will marking the location of stakes in quadrant I help them figure out the location of the stakes in other quadrants?

Good, reflect into other 3 quadrants

Javier has already started working on his strategy and has completed the calculations for the 10-meter circle.

4. Develop a strategy to locate all of the other stakes in the first quadrant for these additional circles. Find the coordinates and arc lengths for each. In your journal, describe the strategy you used to make the fewest calculations for finding the coordinates and arc lengths for these additional stakes.



Staking It

$\cos 22.5 = \frac{x}{20}$

$20\cos 22.5 = x$

$18.48 = x$

$\sin 22.5 = \frac{y}{20}$

$20\sin 22.5 = y$

$7.65 = y$

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

$r\cos\theta = x$

$\sin\theta = \frac{y}{r}$

$r\sin\theta = y$

$S = \frac{22.5^\circ}{360^\circ}(40\pi)$

$S = 7.85$

Homework

Finish 6.7 "Ready, Set, Go"

Mar 28-11:26 AM