Finding Lengths of Arcs and Areas of Sectors

Doesn't that sound like fun?

Well okay, maybe not to you, but these problems are fun. Let's take a look...

Find the length (not the measure) of $\overline{AB}$.  

Step 1. Find the fraction of the circle's circumference that $\overline{AB}$ represents. How? Like this...  
\[
\frac{30^\circ}{360^\circ} = \frac{1}{12}
\]

This is the measure of the part of the circle we want over the total measure of the circle.

Step 2. Find the circumference of the circle...  
\[
C = 2\pi
\]
\[
C = 2\pi \times 2 = 4\pi
\]

Step 3. Multiply the circumference by the fraction... and presto!  
\[
4\pi \times \frac{1}{12} = \frac{4\pi}{12} = \frac{\pi}{3}
\]
\[
\overline{AB} = \frac{\pi}{3} \approx 1.05
\]

Next, let's look at Sectors. What the heck is a sector? A sector is a portion of the area of a circle enclosed by two radii and an arc. Huh? Well if you had a pie and you cut a piece out of it that piece would be a sector of the pie. Like this...

The shaded area in the diagram is a sector. Sector $\overline{CAB}$ is a sector of $\odot C$.

Find the area of sector $\overline{CAB}$.  

Step 1. Find the fraction of the circle that sector $\overline{CAB}$ represents. How? Like this...  
\[
\frac{40^\circ}{360^\circ} = \frac{1}{9}
\]

Step 2. Find the area of the entire circle...  
\[
\Lambda = \pi r^2
\]
\[
\Lambda = \pi \times 4^2
\]
\[
\Lambda = 16\pi
\]

Step 3. Multiply the area by the fraction... and presto!  
\[
16\pi \times \frac{1}{9} = \frac{16\pi}{9}
\]
\[
\text{m}_{\overline{AB}} = \frac{16\pi}{9} \approx 5.59u^2
\]

You try! Find the length of $\overline{CD}$.  

You try! Find the area of sector $\overline{EFG}$.  

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Calculate the length of each arc...

1. 

2. 

3. 

4. 

5. 

6. 

7. 

8. 

Bubble all the correct answers from above. Don’t bubble incorrect answers.

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Find the area of each shaded sector...

9.

10.

11.

12.

13.

14.

15.

16.

Bubble all the correct answers from above. Don’t bubble incorrect answers.

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