

Puppy Play Area
Circle Applications

Name _____

*Idea taken from College Preparatory Mathematics Geometry Connections Curriculum

*Common Core Standard G-C: Find arc lengths and areas of sectors of circles.

Problem: Gabe the puppy is tied by a rope to a 15 meter by 25 meter rectangular garage. Your task is to determine where it would be best to tie the rope so that Gabe has the maximum playing area.

1. If Gabe is tied to the **corner** of the 15 meter by 25 meter garage, determine the total area Gabe will be able to play while tied up given the following rope lengths. For each part, you *need* to draw an accurate picture of Gabe's play area **first**.

a. a 10 meter long rope

Picture:

b. a 20 meter long rope

Picture:

c. a 30 meters long rope

Picture:

2. What if you attached a 30 meter rope to the *middle* of the 25 meter side of the garage (as opposed to the corner)?

a. Do you think Gabe would have more area to play in? Why or why not?

b. Calculate how much area Gabe could play in by moving the rope to the middle and compare that answer to what you got in #1 part c.

Picture:

c. Do you think Gabe would have had more area to play in if you had attached the rope to the *middle of the 15 meter side* instead? How do you know? Justify your answer.

d. Do you think Gabe would have more playing area if the rope were attached to a different part of the garage? Explain and justify your answer.

3. Gabe is given 25 meters of rope. Based on what you already know, where should you tie that rope so that Gabe is given the most area to play in? **Explain.**

Extension: Gabe is happiest when he has at least 600 sq. meters to play. What possible rope lengths could be used?