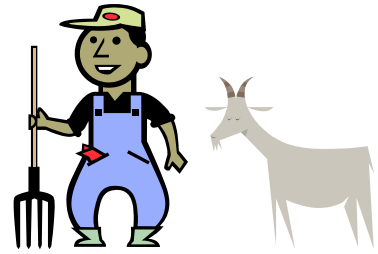


Goat on a Rope



EXTENSIONS

Each group is given a barn that is a regular polygon.

1) Equilateral Triangle:

- a. Suppose the goat is on a rope that is 3 meters long and tied to the corner of a triangular shed whose sides measure 5 meters. What is the amount of grass the goat can reach?
- b. If the rope in part (a) was 7 meters long, what is the amount of grass the goat can reach?
- c. If the goat is on a rope that is 3 meters long and tied to the center of the inside of the triangular shed, (and is confined to the shed) what is the amount of grass the goat can reach?

2) Square:

- a. Suppose the goat is on a rope that is 3 meters long and tied to the corner of a square shed whose sides measure 5 meters. What is the amount of grass the goat can reach?
- b. Suppose the goat is on a rope that is 3 meters long and tied to the middle of the side of the square shed. The shed has sides that are 5 meters long. What is the amount of grass the goat can reach?
- c. If the goat is on a rope that is 3 meters long and tied to the center of the square shed, (and is confined to the shed) what is the amount of grass the goat can reach?

3) Regular Pentagon:

- a. Suppose the goat is on a rope that is 3 meters long and tied to the corner of a pentagonal shed whose sides measure 5 meters. What is the amount of grass the goat can reach?
- b. Suppose the goat is on a rope that is 3 meters long and tied to the middle of the side of the pentagonal shed. The shed has sides that are 5 meters long. What is the amount of grass the goat can reach?
- c. If the goat is on a rope that is 3 meters long and tied to the center of the pentagonal shed, (and is confined to the shed) what is the amount of grass the goat can reach?

4) Regular Hexagon:

- a. Suppose the goat is on a rope that is 3 meters long and tied to the corner of a hexagonal shed whose sides measure 5 meters. What is the amount of grass the goat can reach?
- b. Suppose the goat is on a rope that is 3 meters long and tied to the middle of the side of the pentagonal shed. The shed has sides that are 5 meters long. What is the amount of grass the goat can reach?
- c. If the goat is on a rope that is 3 meters long and tied to the center of the hexagonal shed, (and is confined to the shed) what is the amount of grass the goat can reach?

Extension Obstruction

The goat is tied to a shed on a rope that is 5 meters long. There is a long brick wall that is 3 meters from the shed and parallel to the shed. What is the amount of grass the goat can reach? Draw a picture and explain your answer in the space below.

Answers:

1) $9\pi \text{ m}^2$

2) $6 \frac{3}{4} \pi \text{ m}^2$

3) $5 \pi \text{ m}^2$

4) (a) predictions will vary

(b) $6 \frac{3}{4} \pi \text{ m}^2$

(c) does not

5) $28 \frac{1}{4} \pi \text{ m}^2$

6)

