

Math by Design
Flossville Town Park Tasks and Subtasks Answer Key

Safety First!

Mayor Barnum wants the citizens of Flossville to enjoy the park and he also wants to keep them safe. Make sure that the playground and picnic area include a ground cover to minimize any bumps and bruises in case someone falls!

Safety First! Subtask 1: Cover the playground with rubberized mulch.

Details:

The playground is a composite figure.

One scoop of mulch covers about 36 square meters.

Accepted Answers: 61.8 scoops or 61.9 scoops or 62 scoops

The playground has a square at the top with a semicircle at the bottom.

Area of playground:

$A = \text{area of square} + \text{area of semicircle}$

$$A = (40 \text{ m})^2 + \frac{1}{2}((\pi)(20 \text{ m})^2)$$

$$A \approx 1600 \text{ m}^2 + 628.319 \text{ m}^2$$

$$A \approx 2228.319 \text{ m}^2$$

Number of scoops:

$$n = \frac{\text{area of playground}}{36 \text{ m}^2 / \text{scoop}}$$

$$n \approx \frac{2228.319 \text{ m}^2}{36 \text{ m}^2 / \text{scoop}}$$

$$n \approx 61.8977 \text{ scoops}$$

The area of the playground is about 2228.319 m² so about 61 or 62 scoops of mulch are needed to cover it.

Safety First! Subtask 2: Cover the picnic area with rubberized mulch.

Details:

The shape of the picnic area is a pentagon. It should be considered a composite figure.

One scoop of mulch covers about 36 square meters.

Accepted Answer: 175 scoops

The picnic region is separated into two rectangles and a triangle. Rectangle P is the right side of the region, 90 m by 30 m. Rectangle Q is the bottom left corner, 60 by 30. Triangle R is the top left part, with a base of 60 m and a height of 60 m. (Note: There are other ways to separate the picnic region in order to calculate its area.)

Area of picnic region:

$A = \text{area of } P + \text{area of } Q + \text{area of } R$

$$A = (90 \text{ m})(30 \text{ m}) + (60 \text{ m})(30 \text{ m}) + \frac{1}{2}(60 \text{ m})(60 \text{ m})$$

$$A = 2700 \text{ m}^2 + 1800 \text{ m}^2 + 1800 \text{ m}^2$$

$$A = 6300 \text{ m}^2$$

Number of scoops:

$$n = \frac{\text{area of picnic region}}{36 \text{ m}^2 / \text{scoop}}$$

$$n = \frac{6300 \text{ m}^2}{36 \text{ m}^2 / \text{scoop}}$$

$$n = 175 \text{ scoops}$$

The area of the picnic region is 6300 m², so 175 scoops of mulch are needed to cover it.