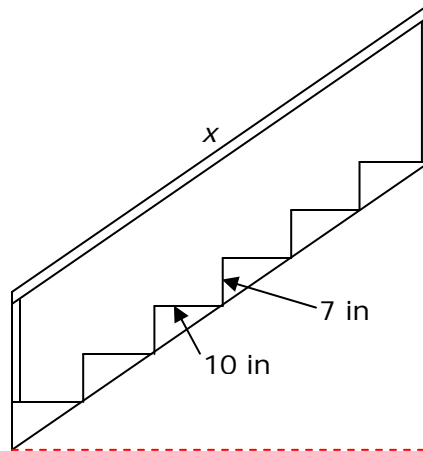


Math by Design
Flossville Town Park Constructed Response Questions Answer Key

Right Angle Concepts

Mr. Carpenter needs to determine the length, x , of the handrail for the stairs on his new deck. The side view is shown in the figure below. Each step is 7 inches high and 10 inches from front to back.



Step A: What is the length of the rail?

Answer: The rail is approximately 73.239 inches long.

Step B: Use what you know about the Pythagorean Theorem to explain how you determined the length of the rail. Use words, numbers, and/or symbols in your explanation.

The base of the triangle shown above is $6(10) = 60$ inches.

The height of the triangle is $6(7) = 42$ inches.

Use the Pythagorean Theorem to calculate the length of the hypotenuse which is the same as the length of the rail.

$$60^2 + 42^2 = x^2$$

$$5364 = x^2$$

$$73.239 \approx x$$

Transformations

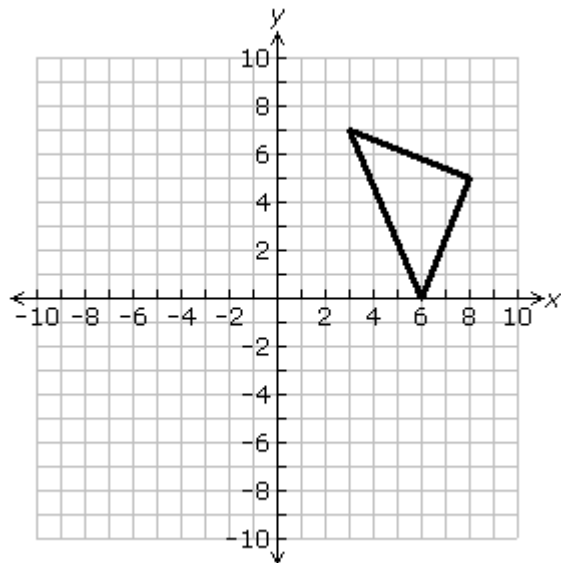
The vertices of the triangle shown below are located at $(6, 0)$, $(3, 7)$ and $(8, 5)$. The triangle is reflected over the y -axis.

Step A: What are the coordinates of the vertices of the triangle after the reflection?

Answer: The vertices of the triangle after the reflection are $(-6, 0)$, $(-3, 7)$ and $(-8, 5)$.

Step B: Use what you know about reflections to explain how you determined the coordinates of the vertices. Use words, numbers, and/or symbols in your explanation.

Answers may vary. The reflected points are each the same distance from the y -axis as the original point but on the opposite side of the y -axis.

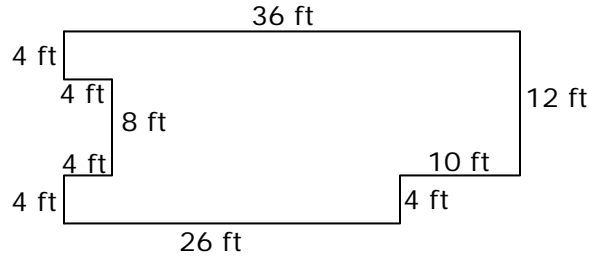


Math by Design

Flossville Town Park Constructed Response Questions **Answer Key**

Area of a Composite Figure

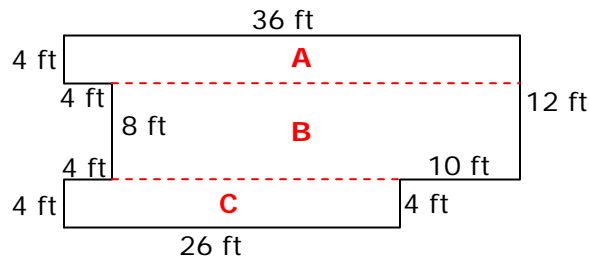
Mrs. Cook is replacing the tile on her kitchen floor. The floor plan of Mrs. Cook's kitchen is shown below.



Step A: What is the area of the kitchen floor?

Answer: The area of the floor is 536 ft^2

Step B: Use what you know about finding the area of a composite figure to explain how you determined the area of the floor. Use words, numbers, and/or symbols in your explanation.



Answers may vary. If the figure is separated into rectangles as shown above, then the three areas are calculated and combined to get the area of the entire region.

Area of rectangle A: $(36 \text{ ft})(4 \text{ ft}) = 144 \text{ ft}^2$

Area of rectangle B: $(32 \text{ ft})(8 \text{ ft}) = 256 \text{ ft}^2$

Area of rectangle C: $(26 \text{ ft})(4 \text{ ft}) = 104 \text{ ft}^2$

Total area of region: $144 \text{ ft}^2 + 288 \text{ ft}^2 + 104 \text{ ft}^2 = 536 \text{ ft}^2$

Volume of a Cylinder

Mr. Smith has a cylindrical swimming pool in his back yard. It has a diameter of 20 feet and is 4 feet deep.

Step A: What is the volume of the swimming pool?

The volume of the swimming pool is approximately 1256.637 ft^3 .

Note: Using 3.14 as the value for π , the volume is 1256 ft^3 .

Step B: Use what you know about finding the volume of a cylinder to explain how you determined the volume of the pool. Use words, numbers, and/or symbols in your explanation.

Since the diameter of the cylinder is 20 ft, the radius is 10 ft.

$$V = \pi(10 \text{ ft})^2(4 \text{ ft})$$

$$V \approx 1256.637 \text{ ft}^3$$

Math by Design

Flossville Town Park Constructed Response Questions **Answer Key**

Proportional Reasoning

An architect is making a scale model of a building he has designed. The scale of the model is 1 in = 2 ft. The length of the model is 35 inches and its width is 20 inches.

Step A: What will be the actual length of the building?

The length of the building will be 70 feet.

Step B: Use what you know about proportional reasoning to explain how you determined the length of the building. Use words, numbers, and/or symbols in your explanation.

$$\frac{1 \text{ in}}{2 \text{ ft}} = \frac{35 \text{ in}}{x \text{ ft}}$$

$$x = 70 \text{ ft}$$