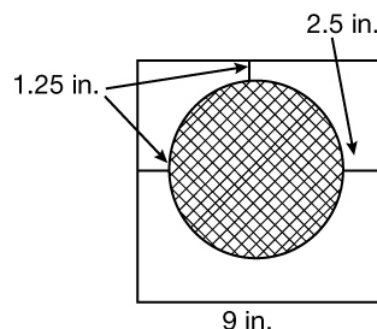


## Sheet-Metal Shapes

Sheet metal is often cut into simple geometric shapes that are used for heating and air conditioning ducts and casings for other products.

1. A sheet-metal worker needs to cut a circular disc from a sheet of stainless steel.



- a. Find the radius of the circular cutout. Show your work.

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- b. To the nearest tenth, approximate the area of the piece of metal left after the circular cutout is made. Show your work.

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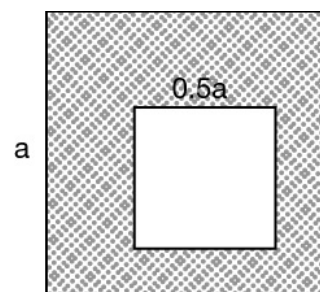
- c. Will the piece of sheet metal shown above fit in a box with a square bottom that has perimeter 36 in.? Explain your response.

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2. This diagram shows a square piece of sheet metal with a square cutout.



- a. Show that the area of the shaded region is  $\frac{3a^2}{4}$ .

Justify your steps.

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- b. Suppose the small square has length  $a - b$  where  $b < 0.5a$ . Show that the area of the shaded region is  $2ab - b^2$ .

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3. Follow the instruction below.

*If a rectangular sheet of aluminum has a perimeter of 24 inches, then place it in bin A.*

- a. A rectangular piece of sheet aluminum has length 5 inches and width 7 inches. Should you place it in bin A? Justify your response.

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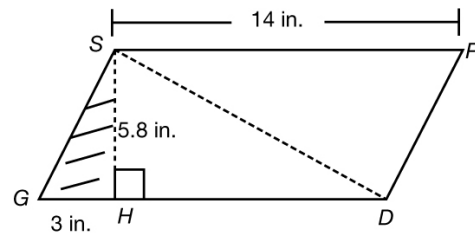
- b. A square piece of sheet aluminum has an area of 36 square inches. Should you place it in bin A? Justify your response.

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4. Ms. Gomez has a sheet of tin in the form of parallelogram  $GSPD$ . She intends to cut a triangular piece from it as shown.



- a. Find the area of polygon  $HSPD$ . Show your work.

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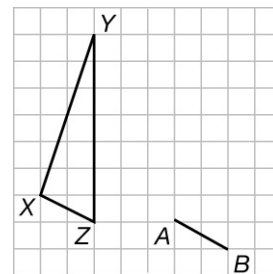
- b. Ms. Gomez wants to cut out a triangular piece of sheet metal from polygon  $HSPD$  to get  $\triangle SPD$ . What is the area of  $\triangle SPD$ ? Show your work.

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5. This diagram shows a triangular piece of sheet metal,  $\triangle XYZ$ .



- a. On this grid, complete the sketch of  $\triangle ABC$  so that  $\triangle ABC$  is congruent to  $\triangle XYZ$ .

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- b. List the congruence correspondences between the sides and angles of  $\triangle XYZ$  and  $\triangle ABC$ .

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