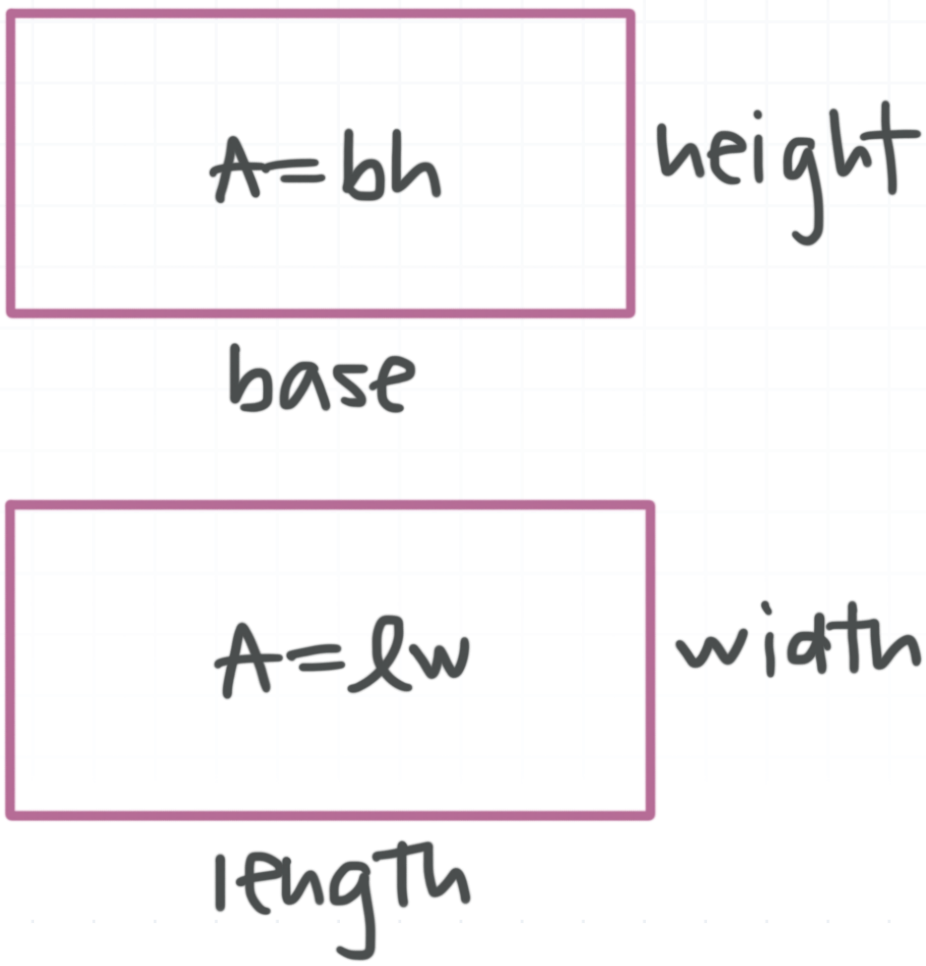
Area of a rectangle

The area of a rectangle is the product of its base and its height. We can also express the area of a rectangle as the product of its length and its width.



An area is always given in units of length^2 (“length squared”). In other words, if the dimensions (base and height, or length and width) of a rectangle are given in inches, the units for area will be in^2 (also called square inches); if the dimensions are given in centimeters, the units for area will be cm^2 (also called square centimeters).

When we given a dimension in units of feet, we sometimes use a single quotation mark instead of the word “feet” or the abbreviation ft. For example, we could express 6 feet as $6'$. For a dimension in units of inches,

we sometimes use a double quotation mark instead of the word inches or the abbreviation in. For example, we could express 37 inches as $37''$.

Let's start by working through an example.

Example

Find the area of the rectangle.

We'll use the formula $A = bh$, where A is the area, b is the base, and h is the height of the rectangle. Plugging in the dimensions of the rectangle, we get

$$A = bh$$

$$A = (12 \text{ ft})(7 \text{ ft})$$

$$A = 84 \text{ ft}^2$$

Let's do one with an additional step.

Example

A rectangular mirror measures 24 inches by 4 feet. What is the area of the mirror?

To find the area of the mirror, you must use the same units for both dimensions. You can convert inches to feet by remembering that there are 12 inches in 1 foot.

$$24 \text{ inches} \cdot \frac{1 \text{ foot}}{12 \text{ inches}} = 2 \text{ feet}$$

Now we can use the fact that the mirror is a rectangle to find its area in square feet. We'll use the formula $A = lw$, where A is the area, l is the length, and w is the width. We don't know which dimension of the mirror is horizontal and which is vertical (and that doesn't matter), so let's let $l = 2$ ft and $w = 4$ ft.

$$A = lw$$

$$A = (2 \text{ ft})(4 \text{ ft})$$

$$A = 8 \text{ ft}^2$$

We could have also found the area in square inches by converting 4 feet to inches.

$$4 \text{ feet} \cdot \frac{12 \text{ inches}}{1 \text{ foot}} = 48 \text{ inches}$$

Then the area in square inches would be

$$A = lw$$

$$A = (24 \text{ in})(48 \text{ in})$$

$$A = 1{,}152 \text{ in}^2$$
