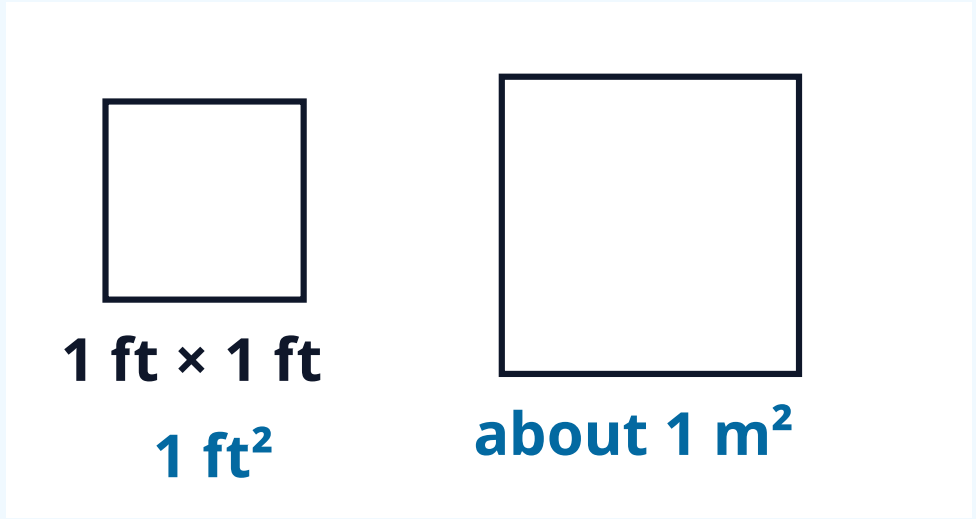
Mathematics 10-3

Unit M: Measurement in SI and imperial

Area of flat shapes

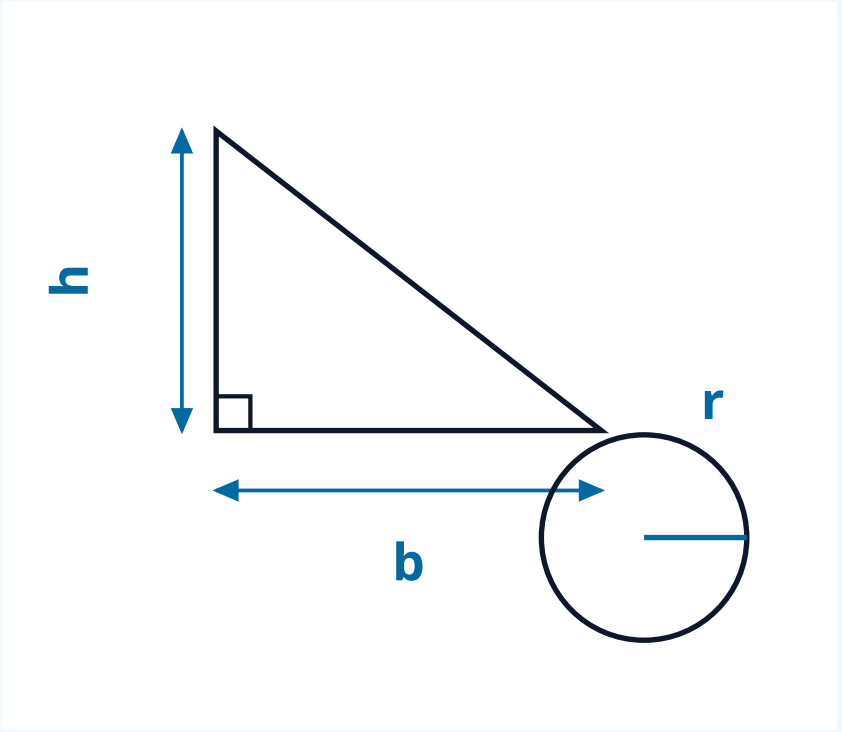
A floor tile and a desk top

- A floor tile 1 foot by 1 foot covers 1 square foot, and a desk top can cover about 1 square metre.
- A painter and a flooring installer both price work from area, so a wild square count wastes material.



Formulas for flat cover

- A rectangle’s area is length times width.
- A means area, l means length, and w means width, so A = l w.
- A triangle’s area is half of base times height.
- The letter b is the base and the letter h is the height.
- For a circle, r is the radius, half the diameter, and A = $3.14r^2$.
- Split an L-shaped room into two rectangles, then add the areas.
- One square metre equals 10 000 square centimetres.



Key terms

square metre

The SI unit of area. A square one metre on each side, written m2. (m2)

radius

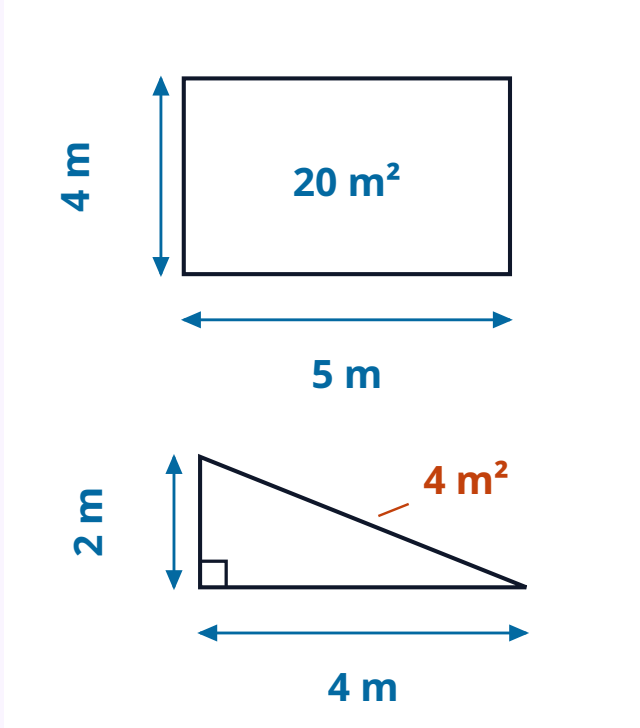
The distance from the centre of a circle to the rim. The radius is half the diameter. (r)

base

The side of a triangle used with the height in the area formula A = (1/2) b h. (b)

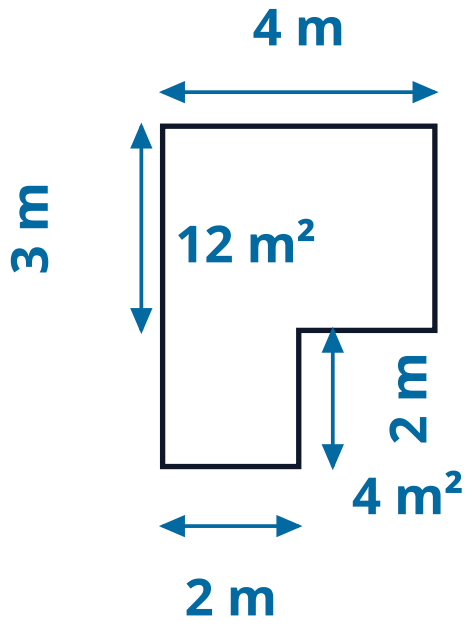
Area of a shed wall

- A square-grid estimate counts full squares and pairs the halves.
- Eight full squares and four half squares estimate 10 square units.
- A rectangle 5 metres by 4 metres has area 5 times 4, which equals 20 square metres.
- A triangle of base 4 metres and height 2 metres has 4 times 2 equals 8, and half of 8 is 4 square metres.
- The shed wall adds those pieces: 20 plus 4 equals 24 square metres.



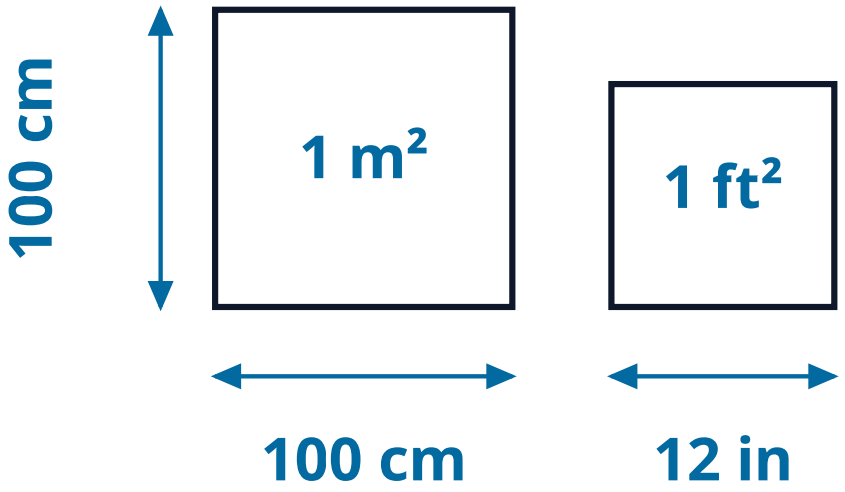
An L-shaped stock room and a bedroom

- Draw the L-shaped room and split it into two rectangles before adding the areas.
- An L-shaped stock room splits into a 4 metre by 3 metre rectangle and a 2 metre by 2 metre rectangle.
- Four times 3 equals 12 square metres.
- Two times 2 equals 4 square metres.
- Twelve plus 4 equals 16 square metres.
- A bedroom 4.8 metres by 3.5 metres splits 3.5 into 3 and 0.5.
- Partial products give 4.8 times 3 equals 14.4, and 4.8 times 0.5 equals 2.4.
- Adding 14.4 and 2.4 equals 16.8 square metres.



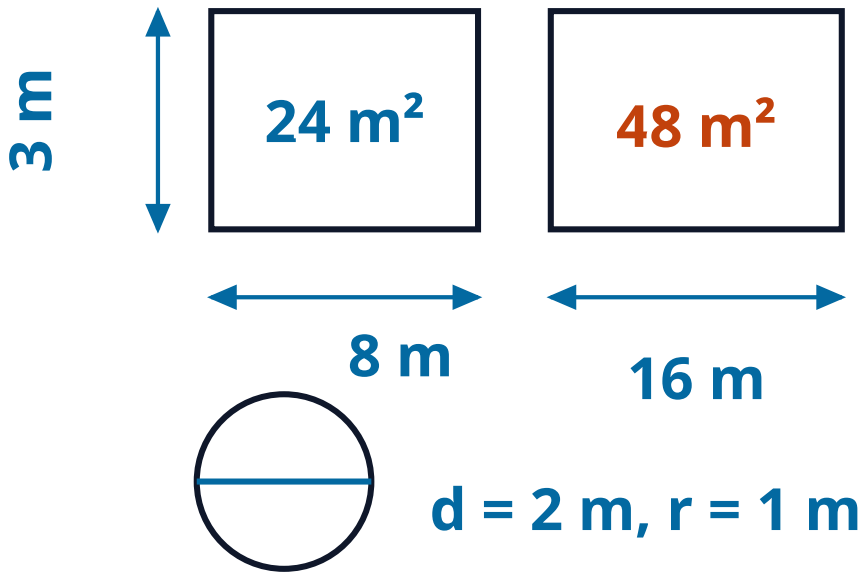
Square units on the order

- The symbol m2 means square metres and cm2 means square centimetres.
- One square metre is a 100 centimetre by 100 centimetre square, so 100 times 100 equals 10 000 square centimetres.
- A patch of 2.5 square metres equals 25 000 square centimetres.
- A patch of 0.4 square metres equals 4000 square centimetres.
- The symbol ft2 means square feet and in2 means square inches.
- One square foot equals 144 square inches, and 3 square feet equal 432 square inches.



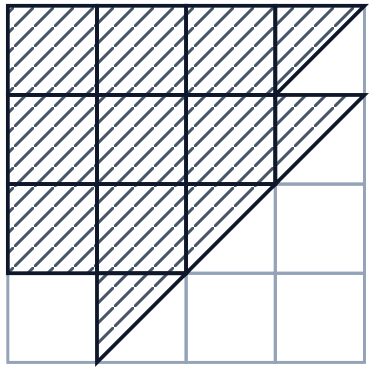
Doubling sides and a round rug

- A rectangle 8 metres by 3 metres has area 24 square metres and perimeter 22 metres, because 2 times (8 plus 3) equals 22.
- Doubling only the length makes 16 by 3.
- Multiplying 16 by 3 equals 48 square metres.
- The new perimeter is 2 times (16 plus 3).
- Sixteen plus 3 equals 19, and 2 times 19 equals 38 metres.
- Doubling both sides makes 16 by 6.
- Multiplying 16 by 6 equals 96, which is 4 times 24.
- A round rug with diameter 2 metres has radius 1 metre.
- $A = \pi r^2$ = 3.14 times 1 times 1, which is 3.14 square metres.



Cover check

- Find the triangle area for base 4 metres and height 2 metres, and the shed total of 24 square metres.
- Rewrite 1 square metre in square centimetres and say where the factor 10 000 comes from.



8 full + 4 halves = 10