3 Surface Area

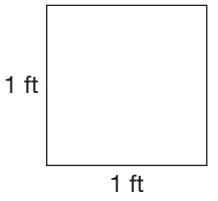
Units of Measurement

1. Match each object to the amount of space it could cover.

beach towel	about 1 sq ft
ruler	about 2 m^2
tablecloth	about 15 cm^2
bathroom scale	about 12 sq in.
pen	about 1 sq yd

Hint

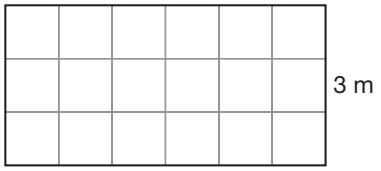
Suppose you cut apart this square and then put the pieces together to make a new shape. The new shape would still cover 1 sq ft.



Working with Polygons

2. The area of a polygon is the number of square units of space that it covers. Name each polygon, and determine its area.

a)

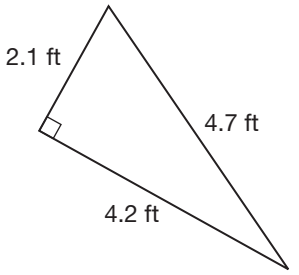


Name of polygon: _____

Area = _____ m × _____ m

= _____ m^2

c)

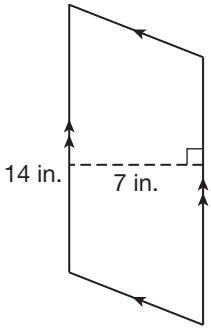


Name of polygon: _____

Area = _____

= _____

b)



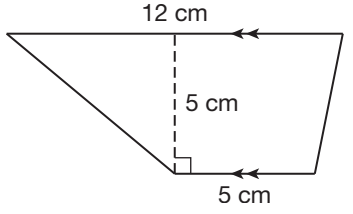
Name of polygon:

_____

Area = _____

= _____

d)



Name of polygon:

_____

Area = _____

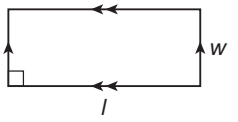
= _____

areas of polygons

rectangle

A = (length)(width)

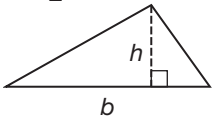
$= lw$



triangle

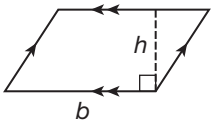
$A = \frac{1}{2}$(base)(height)

$= \frac{1}{2}bh$



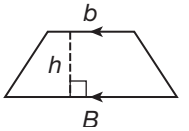
parallelogram

$A = bh$



trapezoid

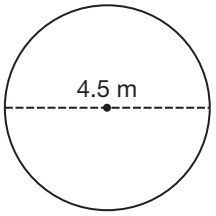
$A = \frac{1}{2}(b + B)h$



Working with Circles

3. Use the formulas at the right. If your calculator does not have a key for π, use 3.14 as an estimate for π.

a) Determine the circumference, to the nearest whole unit.



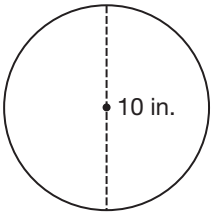
diameter = _____ m

C = _____ × _____ m

= _____ m,

or about _____ m

b) Determine the area, to the nearest whole unit.



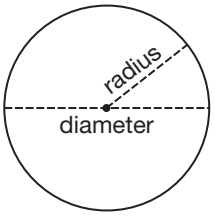
radius = _____ in.

A = _____ × (_____ in.)^2

= _____ sq in.,

or about _____ sq in.

circle formulas



circumference

$C = \pi \times$ (diameter)
or
$C = 2\pi \times$ (radius)

area

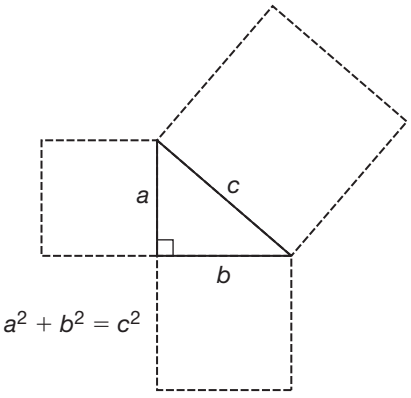
$A = \pi \times$ (radius)^2

Using the Pythagorean Theorem

The Pythagorean theorem can be used for right triangles.

Pythagorean theorem: Suppose you drew a square on each side of a right triangle. You could exactly cover the square on the longest side by combining the areas of the squares on the two shorter sides.

Suppose you knew the lengths of two sides of a right triangle. You could use this formula to calculate the length of the third side.



4. Use the Pythagorean theorem to calculate the unknown side length. Label each length on the diagram, to one decimal place.

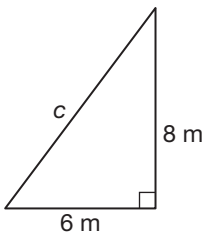
$(6\text{ m})^2 + (8\text{ m})^2 = c^2$

_____ m^2 + _____ m^2 = c^2

_____ m^2 = c^2

$\sqrt{\text{\_\_\_\_\_}\text{ m}^2} = \sqrt{c^2}$

_____ m = c



Hint

The square root of a number is the side length of a square whose area is the number. For example: $\sqrt{9} = 3$ because a square with an area of 9 square units has sides that are 3 units long ($3 \times 3 = 9$).