Learning Goal: Today I will learn how to find the area of a parallelogram and a triangle.

Success Criteria: I am able to identify the base and use it to find area.

10-1 Area of Parallelograms and Triangles

Flip Books

You will need:

- 4 pieces of paper

Unit 9 --Area

Areas of:
Parallelogram
Rectangle
Triangle
Rectangle using Quadratics
Trapezoid
Rhombus
Kite
Circle
Regular Polygon

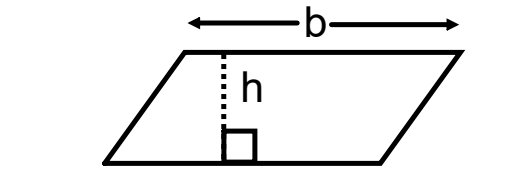
Your Name

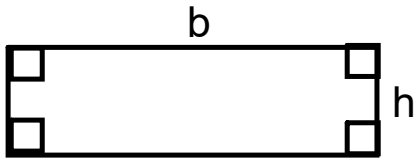
Front page

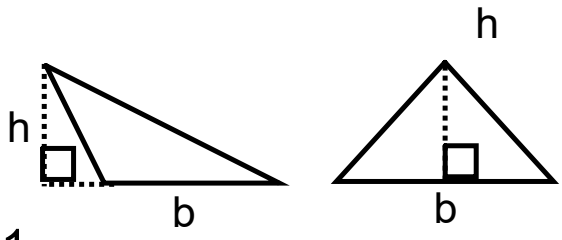
Use colored pens and/or highlighters if you have them!

Flip Books

Label your inside pages







1

Area of a Parallelogram

$A = b * h$

b - base length

h - height (distance between 2 parallel sides)

Area of a Rectangle

$A = b * h$

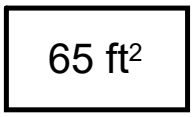
Area of a Triangle

$$A = \frac{b * h}{2}$$

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

2

Area of a Rectangle using Quadratics



Find the dimensions of the rectangle.

1. Write the area formula. Substitute what you know.

$A = b*h$

$65 = (x+3)(x-5)$

2. To solve, the equation must be equal to zero. Move area to the other side.

$65=(x+3)(x-5)$ Distribute
$65=x^2-5x+3x-15$ Simplify
$65=x^2-2x-15$
$65=x^2-2x-15$
$-65 \quad -65$
$0=x^2-2x-80$ set = 0

3

3. Factor

$0= x^2 -2x -80$
$0= (x+8)(x-10)$

Factors of -80:
1 & -80
2 & -40
3
4 & -20
5 & -16
6
7
8 & -10
9

4. Set each factor equal to zero and solve for x.

$x+8=0$ $x-10=0$
$x= -8$ $x= 10$

5. Use the positive solution to find the dimensions.

base: $x + 3 = 10 + 3$ $= 13$

height: $x - 5 = 10 - 5$ $= 5$

13 x 5

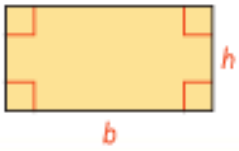
4

take note

Theorem 10-1 Area of a Rectangle

The area of a rectangle is the product of its base and height.

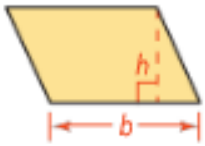
$A = bh$



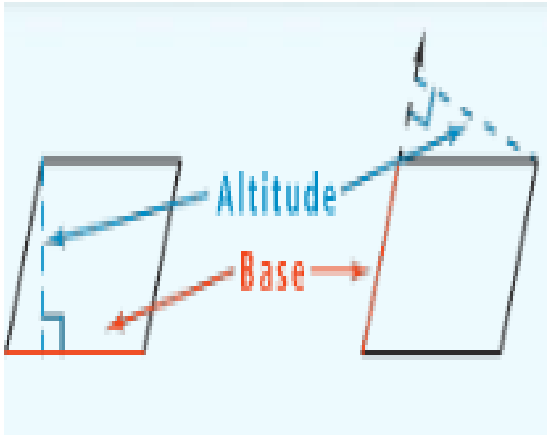
Theorem 10-2 Area of a Parallelogram

The area of a parallelogram is the product of a base and the corresponding height.

$A = bh$



A **base of a parallelogram** can be any one of its sides. The corresponding **altitude** is a segment perpendicular to the line containing that base, drawn from the side opposite the base. The **height** is the length of an altitude.

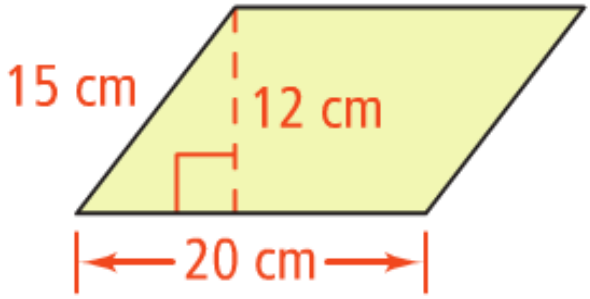


altitutude = height

Example

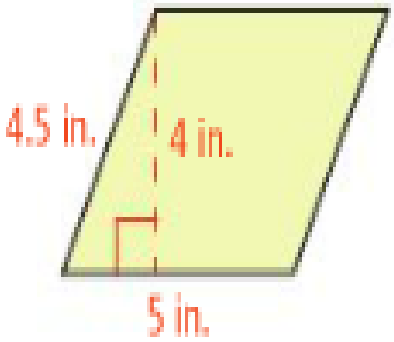
$A = 20 \cdot 12$

$A = 240\ cm^2$



What is the area of each parallelogram?

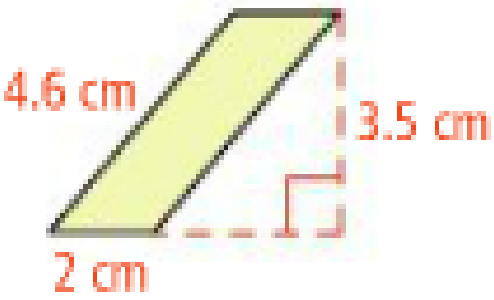
A



$A = 5in(4in)$

$A = 20in^2$

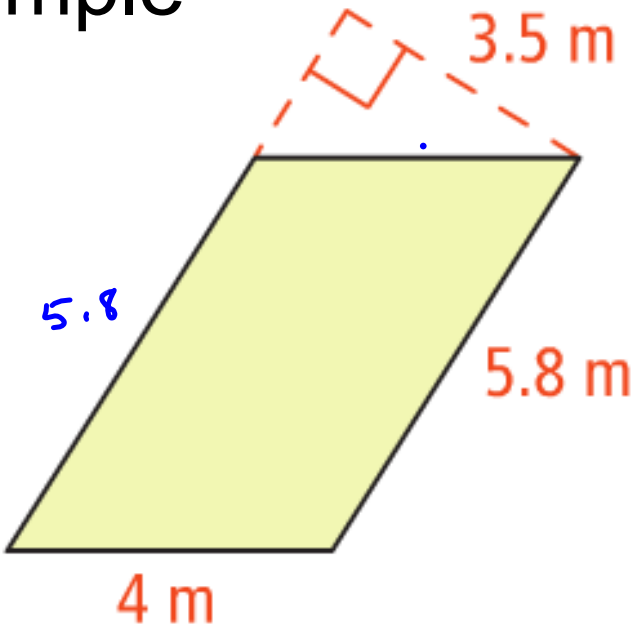
B



$A = 2(3.5)$

$A = 7cm^2$

Example



$A = 5.8(3.5)$

$A = 20.3\ m^2$

Problem 2 Finding a Missing Dimension

For $\square ABCD$, what is DE to the nearest tenth?

First, find the area of $\square ABCD$. Then use the area formula a second time to find DE.

$$A = bh$$

$$= 13(9) = 117 \quad \text{Use base } AD \text{ and height } CF.$$

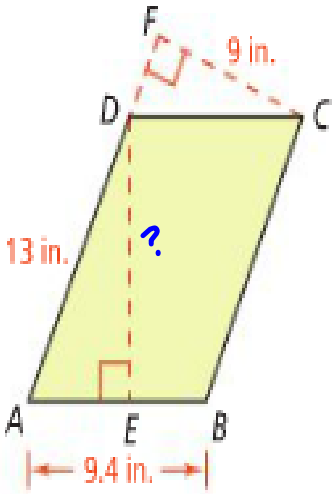
The area of $\square ABCD$ is 117 in.^{2}.

$$A = bh$$

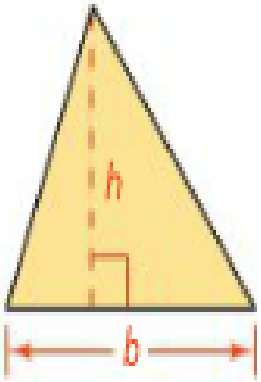
$$117 = 9.4(DE) \quad \text{Use base } AB \text{ and height } DE.$$

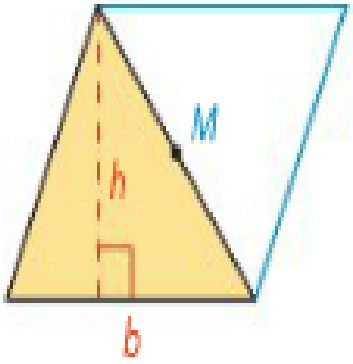
$$DE = \frac{117}{9.4} \approx 12.4$$

DE is about 12.4 in.



You can rotate a triangle about the midpoint of a side to form a parallelogram.





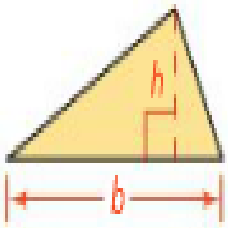
The area of the triangle is half the area of the parallelogram.

take note

Theorem 10-3 Area of a Triangle

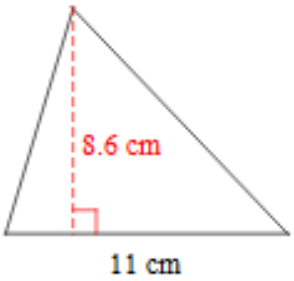
The area of a triangle is half the product of a base and the corresponding height.

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



Find the area of each.

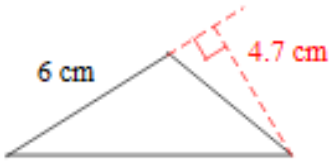
1)



47.3 cm^2

$A = \frac{1}{2}(8.6)(11)$

2)



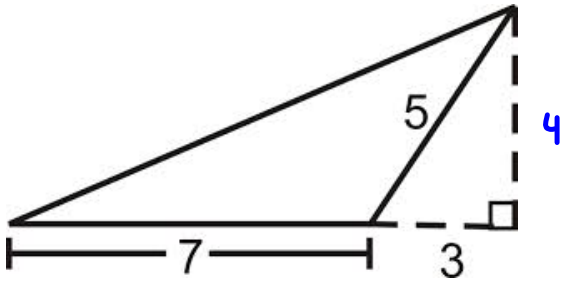
14.1 cm^2

C (4.7)

Example

$A = \frac{1}{2}(7)(4)$

$A = 14\ u^2$



$5^2 - 3^2 = b^2$

$25 - 9 = 16$

$\sqrt{16}$

Problem 4 Finding the Area of an Irregular Figure

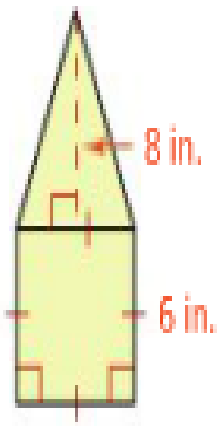
What is the area of the figure at the right?

Find the area of each part of the figure.

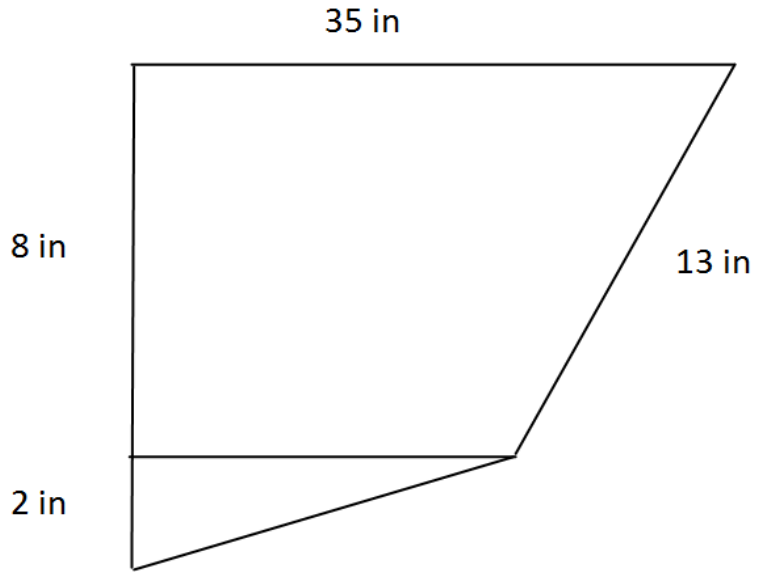
triangle area

square area =

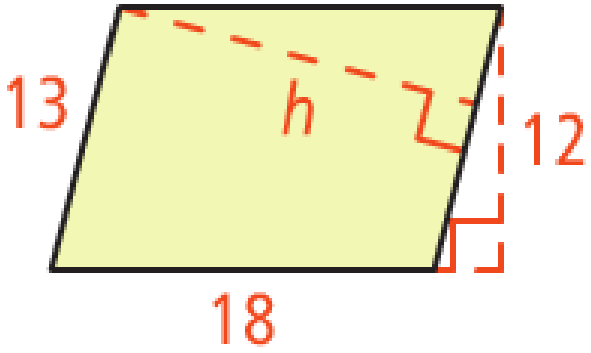
area of the figure =

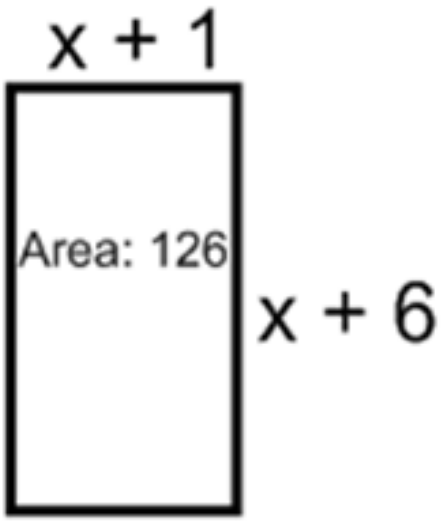


Example



Individual Paper Practice

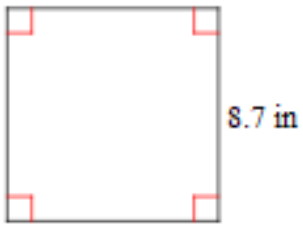



x + 1
Area: 126
x + 6

Individual Paper to be handed in

Find the area of each.

1)



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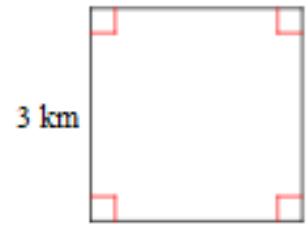

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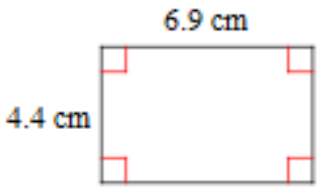

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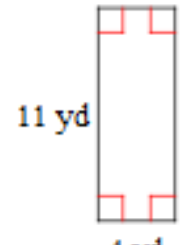

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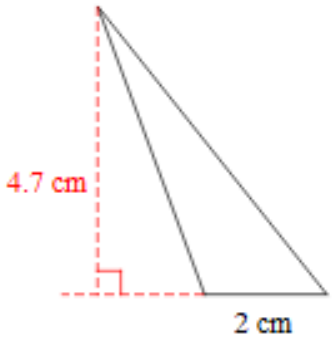

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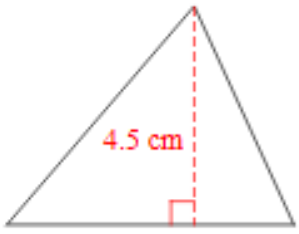
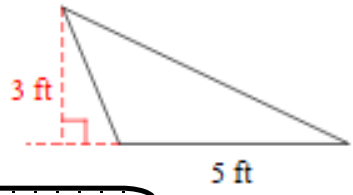


7)

8)



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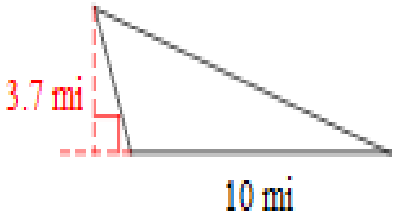

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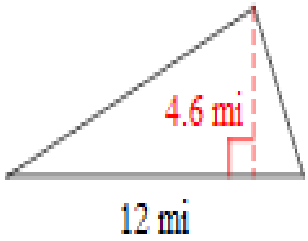

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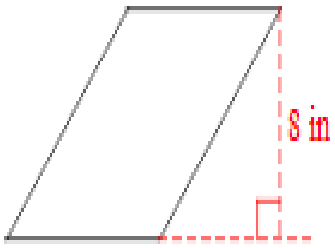

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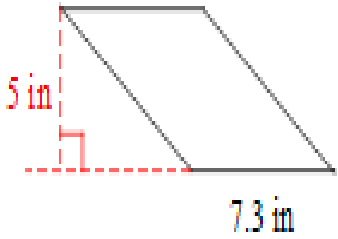

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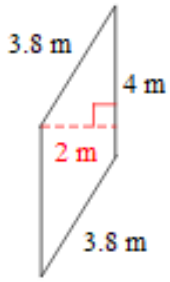
13)



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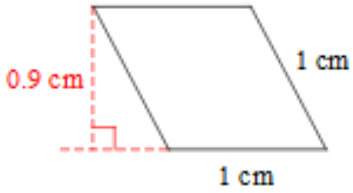

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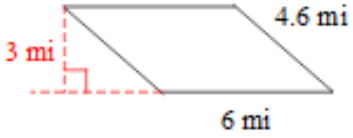

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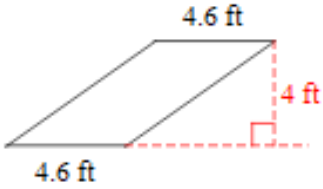

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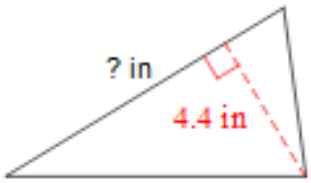
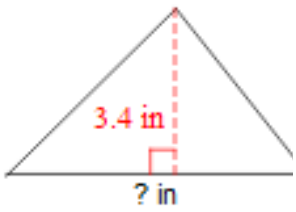


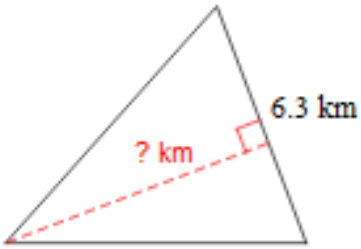
Area = 20.2 in²

18)



Area = 10.4 in²

19)

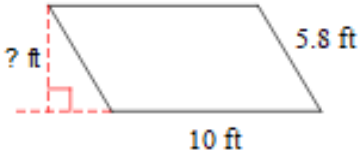


Area = 22.1 km²

20)

Area = 29.3 km²

21)

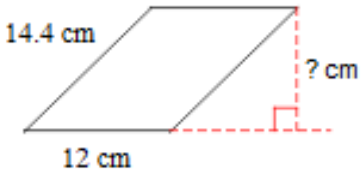


Area = 50 ft²

22)

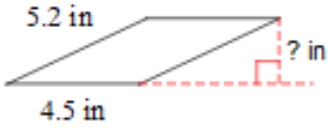
Area = 75.6 km²

23)



Area = 120 cm²

24)



Area = 9.9 in²