11.1 &11.2 Honors Geometry

DATE: 5/14

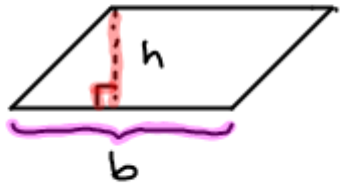
How do you calculate the **area of a square**?

$A_{sq} = s^2$ units^2

How do you calculate the **area of a rectangle**?

$A_{rect} = b \cdot h$ units^2

Draw a sketch of a parallelogram. The label the base and height in your diagram.



NOTE: height (altitude) ⊥ to base

Area of Parallelogram = $b \cdot h$ units^2

Draw a sketch of an acute, right, and obtuse triangle. Then label the base and height in each of your diagrams.

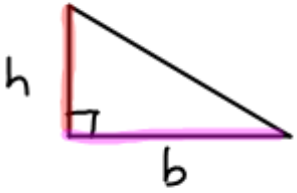
Acute Right Obtuse

Area of Parallelogram = _____

Draw a sketch of an acute, right, and obtuse triangle. Then label the base and height in each of your diagrams.

Acute

Right



Obtuse

Area of Triangle = $\frac{1}{2} b \cdot h$ units^2

Examples

1) Find the area of a square with diagonal 5.

45 45 90

x x $x\sqrt{2}$

$\frac{5}{\sqrt{2}} = \frac{x\sqrt{2}}{\sqrt{2}}$

$\frac{5}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{5\sqrt{2}}{2}$

side = $\frac{5\sqrt{2}}{2}$

$A_{sq} = s^2$

$= \left(\frac{5\sqrt{2}}{2}\right)^2$

$= \frac{5\sqrt{2}}{2} \cdot \frac{5\sqrt{2}}{2}$

$= \frac{25 \cdot 2}{4}$

$= \frac{50}{4} = \frac{25}{2}$ units^2

2) Find the perimeter of a square whose area is 100.

$A = s^2$

$\sqrt{100} = \sqrt{s^2}$

$s = 10$

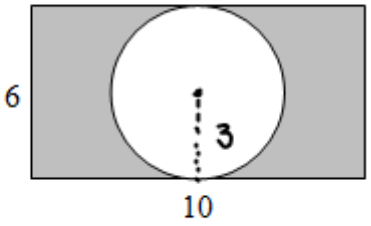
Perimeter $= 4 \cdot 10 = 40$ units

3) Find the area of the shaded region.

$A_{shaded} = A_{rect} - A_{\odot}$

$= 10 \cdot 6 - \pi (3)^2$

$= (60 - 9\pi \text{ units}^2)$



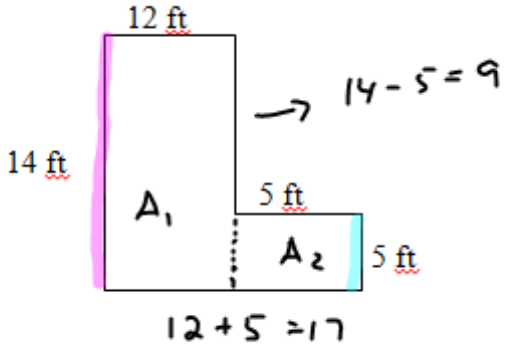
4) Find the perimeter and area of the figure.

$P = 14 + 12 + 9 + 5 + 5 + 17 = 62 \text{ ft}$

$A_L = A_1 + A_2$

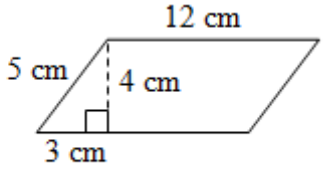
$= 12 \cdot 14 + 5 \cdot 5$

$= 168 + 25 = (193 \text{ ft}^2)$

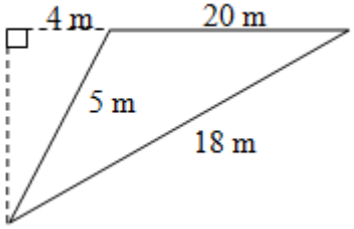


5) Find the area of each.

a)



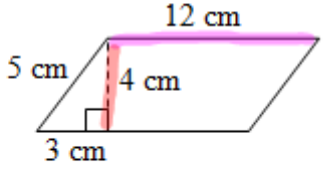
b)



c) Triangle whose sides are 25, 25, and 14.

5) Find the area of each. base height

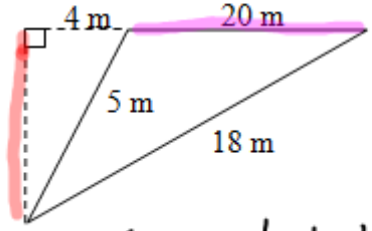
a)



(3,4,5)

$A_{\text{parallelogram}} = b \cdot h$
$= 12 \cdot 4$
$= 48\ cm^2$

b)



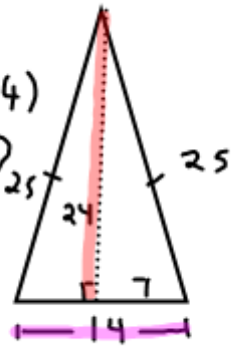
3

$A_\Delta = \frac{1}{2} b \cdot h$
$= \frac{1}{2}(20) \cdot 3$
$= 30\ m^2$

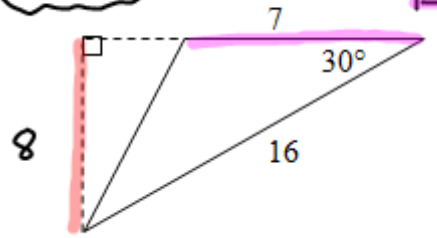
c) Triangle whose sides are 25, 25, and 14

(7, 24, 25)

$A_\Delta = \frac{1}{2} b \cdot h$
$= \frac{1}{2}(14)(24)$
$= 168\ units^2$



6) Find the area of the triangle.

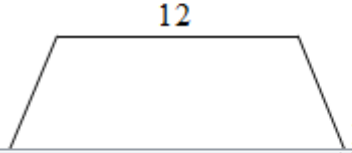


$A_\Delta = \frac{1}{2} bh$
$= \frac{1}{2}(7)(8) = 28\ units^2$

30 − 60 − 90
↓ ↓ ↓
x x√3 2x

$2x = 16$
$x = 8$

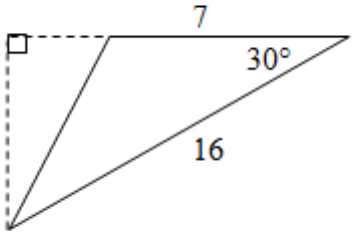
7) Find the area of the trapezoid by dividing it into other figures. Divide and conquer!



3 cm

18 in

6) Find the area of the triangle.



7) Find the area of the trapezoid by dividing it into other figures. Divide and conquer!

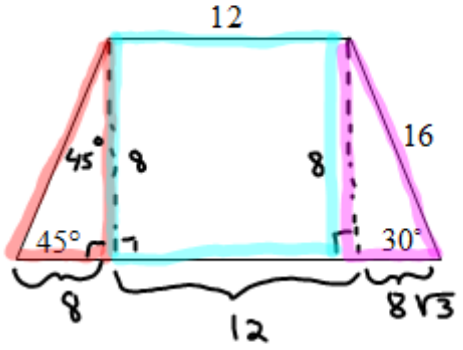
$A_{TRAP} = A_{\Delta_1} + A_{rect} + A_{\Delta_2}$

$= \frac{1}{2}(8)(8) + 12 \cdot 8 + \frac{1}{2}(8\sqrt{3}) \cdot 8$

$= 32 + 96 + 32\sqrt{3}$

$= 128 + 32\sqrt{3}$ units^2

45-45-90 → x x $x\sqrt{2}$ → 8 8



30-60-90 → x $x\sqrt{3}$ $2x$

$16 = 2x$

$8 = x$