NAME: Kelly DATE: 3/7/18 PRD:

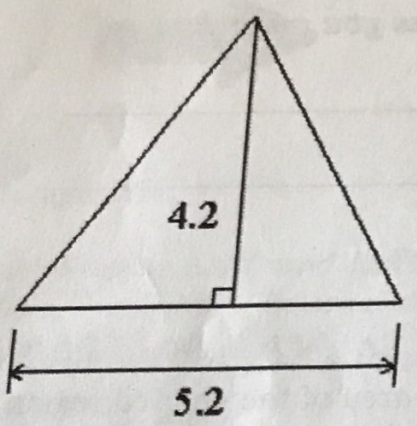
WHAT IS AREA?!?!

What are some of our important area formulas?!?!

Area of a square: $l \times w$	Area of a rectangle: $l \times w$
Area of a triangle: $\frac{1}{2} b \times h$	Area of a circle: πr^2

Example #1:

Calculate the area of the triangle



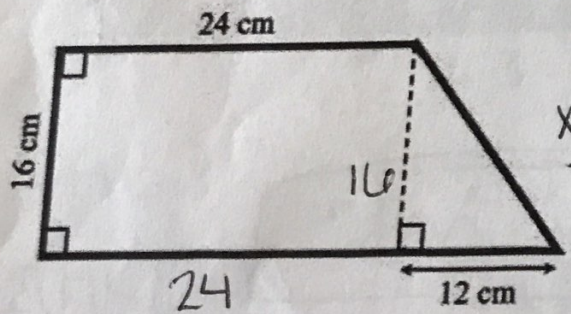
$A = \frac{1}{2} bh$

$\frac{1}{2}(5.2)(4.2)$

10.92 units^2

Example #2:

Given the polygon below, calculate its area.



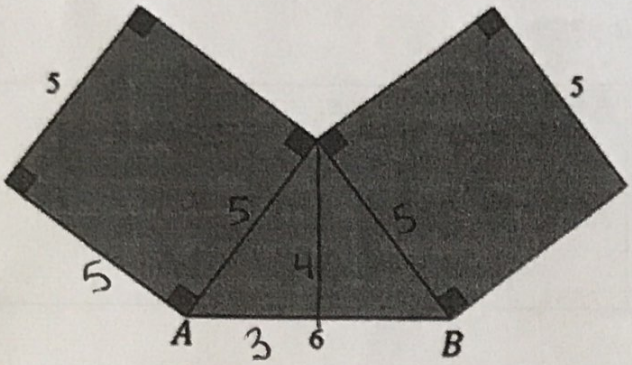
16
×24
384

$\frac{1}{2}(16)(12)$
96

$384 + 96 = 480 \text{ cm}^2$

Example #3:

Two squares with side length 5 meet at a vertex and together with segment *AB* form a triangle with base 6 as shown. Find the area of the shaded region.



$5 \times 5 = 25$

$\times 2$

50

$\frac{1}{2}(6)(4) = 12$

$50 + 12 = 62 \text{ units}^2$

$3^2 + x^2 = 5^2$

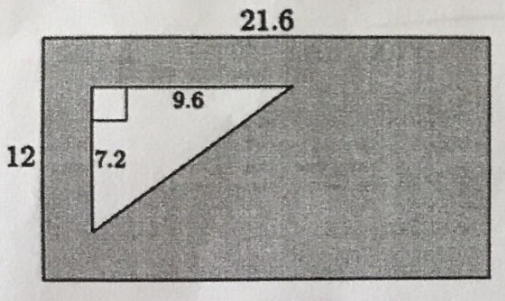
$9 + x^2 = 25$ $\quad x^2 = 16$

RULE: ***To determine the area of the union of two regions you must...***

ADD both of the areas

Example #4:

A rectangle with dimensions 21.6 × 12 has a right triangle with a base of 9.6 units and a height of 7.2 units cut out of the rectangle. What is the area of the shaded region?



$21.6 \times 12 = 259.2$

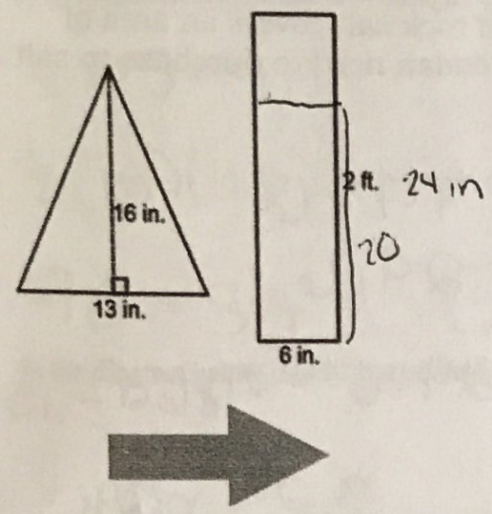
$\frac{1}{2}(7.2)(9.6) = 34.56$

$259.2 - 34.56$

224.64 units^2

Example #5:

Wood pieces in the following shapes and sizes are nailed together in order to create a sign in the shape of an arrow. The pieces are nailed together so that the rectangular piece overlaps with the triangular piece by 4 inches. What is the area of the region in the shape of an arrow?



$20 \times 6 = 120 \text{ in}^2$

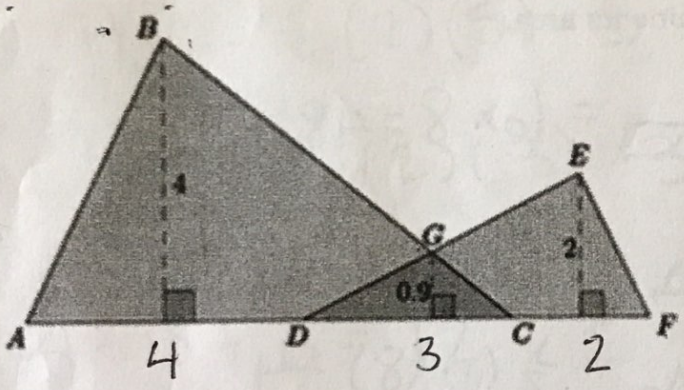
$\frac{1}{2}(13)(16) = 104 \text{ in}^2$

$120 + 104$

224 in^2

Example #6:

Two triangles ΔABC and ΔDEF are shown below. The two triangles overlap forming ΔDGC. The base of figure *ABGEF* is comprised of segment of the following lengths. *AD=4, DC=3, and CF=2.* Calculate the area of the figure *ABGEF*.



$2AC + DF - .45DC$

$14 + 5 - 1.35$

17.65 units^2

ΔABC

$\frac{1}{2}(AC)(4)$

$2AC$

14

ΔDEF

$\frac{1}{2}(DF)(2)$

DF

5

ΔDGC

$\frac{1}{2}(DC)(.9)$

$.45DC$

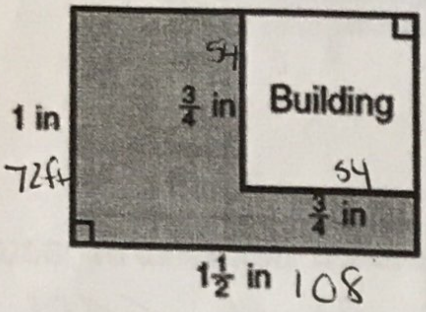
1.35

RULE: To determine the area of the difference of two regions, you must

Subtract the smaller area from the larger area

Example #7:

The accompanying diagram represents a scale drawing of the property where Brendan's business is located. He needs to purchase rock salt to melt the ice on the parking lot (shaded area) around his building. A bag of rock salt covers an area of 1500 square feet. How many bags of rock salt does Brendan need to purchase to salt the entire parking lot?



Scale: $\frac{1}{4}$ in = 18 ft

$72 \times 108 = 7776$

$54 \times 54 = 2916$

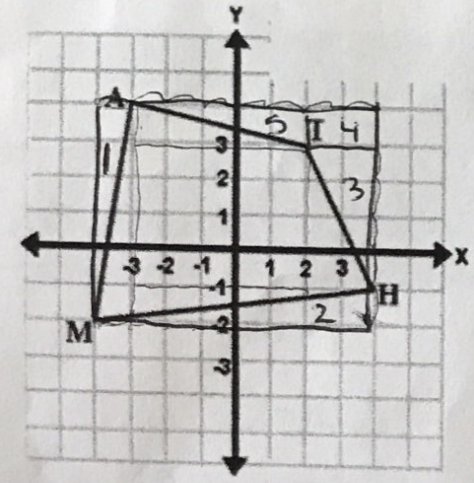
$7776 - 2916 = 4860 \div 1500$

3.24 bags

4 bags

Example #8:

Given the quadrilateral below, determine its area.



$A_{\square} = 6 \times 8 = 48$

$A_{\Delta_1} = \frac{1}{2}(1)(6) = 3$

$A_{\Delta_2} = \frac{1}{2}(1)(8) = 4$

$A_{\Delta_3} = \frac{1}{2}(2)(4) = 4$

$A_4 = 2$

$A_{\Delta_5} = \frac{1}{2}(1)(5) = 2.5$

15.5

48

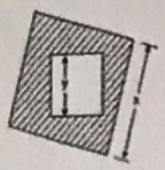
-15.5

132.5 units^2

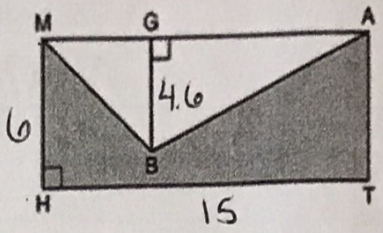
$x^2 - y^2$

The accompanying diagram shows a square with side y inside a square with side x. Which expression represents the area of the shaded region?

1) x^2 2) y^2 3) $y^2 - x^2$ 4) $x^2 - y^2$



In the diagram below, *MATH* is a rectangle, $GB = 4.6$, $MH = 6$, and $HT = 15$. What is the area of polygon *MBATH*?

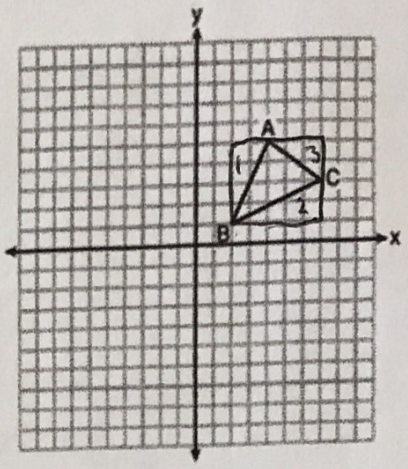


$6 \times 15 = 90$

$\frac{1}{2}(15)(4.6) = 34.5$

$90 - 34.5 = \boxed{55.5 \text{ units}^2}$

In the diagram below, ΔABC has vertices $A(4,5)$, $B(2,1)$, and $C(7,3)$. Determine the area of ΔABC.



$A_{\square} = 5 \times 4 = 20$

$A_{\Delta_1} = \frac{1}{2}(2)(4) = 4$

$A_{\Delta_2} = \frac{1}{2}(2)(5) = 5$

$A_{\Delta_3} = \frac{1}{2}(2)(3) = 3$

$4 + 5 + 3 = 12$

$20 - 12 = \boxed{8 \text{ units}^2}$